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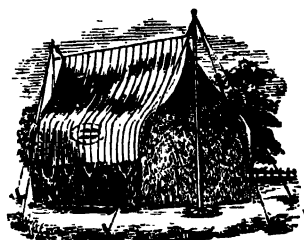
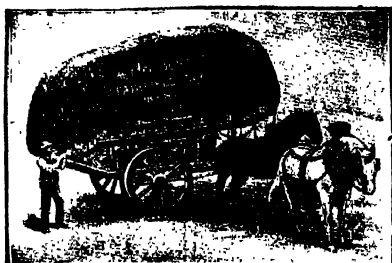
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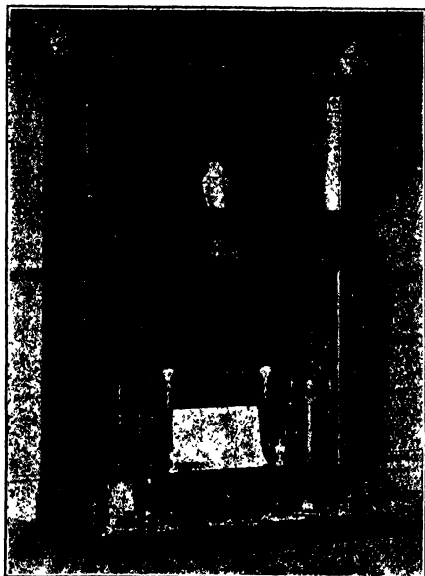
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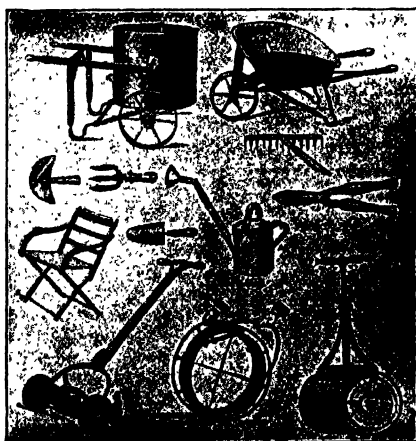
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ILLUSTRATIONS.

Causes of Variation in Milk Records : Figs. 1 to 4 .. following page 24

Fairiery Exhibition at Taunton following page 96

The Physiology of the Nutrition of Fruit Trees : Figs. 1 & 2 following Page 160

CONTENTS.

VOLUME XIX—FIFTH SERIES. 1924-25.

ORIGINAL ARTICLES AND REPORTS.

	PAGE.
I. Spraying for Weed Eradication By Winifred E. Brinckley.	1
II. The Causes of Variation in Milk Records By John Hammond and H. C. Saunders.	20
III. Recent Developments in Commercial Fruit Culture .. By Ernest M. Bear.	34
IV. The Basket Willow Crop as a Means of Utilizing Wet Land.. By Henry P. Hutchinson.	49
V. Concerning Fungus Pests By Leonard S. Bastin.	57
VI. Vocational Training in Agriculture By Gervaise Turnbull.	73
VII. The Improvement of Poor Pastures. By T. Wallace, M.Sc., M.C.	77
VIII. The Society's Exhibition at Taunton By F. H. Storr.	90
IX. The Dairy Department at Taunton By A. F. Somerville, Steward.	94
X. The Forestry Department at Taunton By G. Lipscomb, Steward.	104
XI. Agricultural Education and Research at Taunton .. By H. M. Cundall, I.S.O., F.S.A., Steward.	106
XII. The Exhibition of Cider at Taunton By Major E. W. Farwell, Steward.	110

CONTENTS.

	PAGE
XIII The 1924 Small Holdings Competition By E. Pritchard.	114
XIV. Annual Report upon the Society's General Operations . . By F. H. Storr.	117
XV. The Report of the National Fruit and Cider Institute . . By Prof. B. T. P. Barker, M.A.	123
XVI. Report of the Consulting Chemist for 1924 By Dr. J. A. Voelcker, M.A., F.I.C.	241

CONTENTS.

APPENDIX.

TAUNTON MEETING, 1924.

	PAGE
Judges	i
Awards	iv

PRIVILEGES, LAWS, OFFICERS, ETC.

Objects of the Society	cx i
Terms of Membership	cxii
General Laws	cxiii
Council and Officers	cxvi

List of Annual Exhibitions	cxvii
Privileges of Analyses	cxv

MAIDSTONE MEETING, 1925.

Donors of Money Prizes	cxixi
Judges and List of Prizes for Stock, Produce, etc.	cxix
Conditions and Regulations for Ditto	clvii
Judges and Prizes for Poultry	clxvii
Conditions and Regulations for Ditto	clxx

FINANCE.

Summary of Cash Account to December 31st, 1924	clxxiv
Annual Cash Account	clxxvi
Assets and Liability Account	clxxxvi
Financial Result of Taunton Show	clxxxvii
List of Members	clxxxviii
INDEX	ccxxiii

" He that goes about to forward agricultural improvement must begin by finding out the true reason of what is called routine, or ' the custom of the country.' It sometimes happens that these reasons are only accidental, and then you may dismiss them fearlessly ; but often it turns out that every-day practice rests on a solid foundation of facts ; and then if you make an onslaught on local prejudices, they will be sure to beat you."

" The true course for the agricultural improver is, to take one step at a time, to gain a clear insight into facts by experience, not to try to go too fast, and to trust to the work of time."

" If practice which sets up to do without theory is contemptible, theory without practice is foolhardy and perfectly useless."—*From the Rural Economy of England, Scotland and Ireland*, by LEONCE DE LAVERGNE.

*Journal Communications should be addressed to the Editor,
3, Pierrepont Street, Bath.*

JOURNAL

OF THE

BATH AND WEST AND SOUTHERN COUNTIES SOCIETY.

Original Articles and Reports.

I.—SPRAYING FOR WEED ERADICATION.

*By Winifred E. Brenchley, D.Sc., F.L.S.
(Rothamsted Experimental Station).*

The effective control of weeds is of such paramount importance to the agriculturist from an economic standpoint that, even after centuries of practical endeavour to subdue the unwanted intruders, fresh ideas for their eradication are eagerly watched for and tested by the more enlightened farmers, and promising methods are adopted and put into operation in suitable circumstances. It often happens, however, that certain of the newer methods, such as wet and dry spraying, need a certain degree of skilled knowledge with regard to their application, without which failure to achieve the desired result frequently occurs. Valuable methods are thus brought into disrepute and are neglected by a large section of the farming community, which, for lack of a little essential knowledge, is thus deprived of a valuable means of improving the condition of the land and increasing the crop output and consequent profit. In the present condition of agricultural affairs such neglect can ill be afforded, and, in spite of all that has been written on the subject, a useful purpose may be served by summarising the results already obtained in weed eradication by the use of chemical sprays and manures.

The harmful effect of weeds upon crop yield is obvious to the most inexperienced cultivator, and many of the normal methods of cultivation are directed towards keeping the land clean in order

to enable the crop to develop free from the competition of weeds. An instructive experiment* showing the effect of hoeing upon a sugar beet crop was one in which trials were made of 1 to 5 hoeings, the times being arranged so that the third hoeing on one plot was given at the same time as the fifth hoeing on another. The yield increased with the number of hoeings, viz.,—

One hoeing	6	tons per acre
Two „	7 $\frac{1}{4}$	„ „ „
Three „	9 $\frac{1}{2}$	„ „ „
Four „	11 $\frac{1}{4}$	„ „ „
Five „	11 $\frac{3}{4}$	„ „ „

Part of this increase is to be attributed to the improved soil conditions brought about by the repeated cultivation, but much is due to the freedom from competition due to weed suppression. Instances in which the former factor is absent, and the increase is entirely due to the latter, will be found in various tables later on in this article (see pp. 13, 14, *et seq.*).

Under ordinary circumstances much can be done to keep weeds under control by means of well directed cultural operations and judicious rotation of crops. Where, however, the land has been in any way neglected or wrongly cropped, numbers of weeds may be so rampant as to defy the best methods of cultivation, and even on well tilled soil certain weeds, such as charlock and poppy, are often so plentiful as to cause serious depreciation of crop. In cases such as these other methods need to be adopted, and spraying or dusting with various chemical substances or fertilisers provides a useful means of dealing with the problem. At present spraying is usually regarded as an extreme resource, only to be applied when all other means fail, but, if utilised intelligently, the method might be made a great asset towards increased crop production under more normal circumstances. It also helps to reduce the cost of harvesting, as sprayed cereals tend to cut easily and smoothly, whereas in unsprayed areas the binders are often checked by the abundance of charlock and other weeds, thus occasioning loss of time and danger of injury to the machines. The question resolves itself into one of economics in relation to

1. Cost of spraying
2. Increased value of crop obtained by spraying.

A certain amount of experimental work has been done from this economic standpoint, the results indicating the possibility of considerably increased profit where spraying is carried out successfully.

* "Home Counties" (1911) Sugar Beet, pp. 121-2.

Up to the middle of the 19th century it was believed that large dressings of salt or lime-containing substances aided in the eradication of weeds, though these means were not always successful. During the last forty years active search has been made for chemical weed killers, and various manurial salts, carbolic acid, sulphuric acid, ammoniacal liquor and other plant poisons have been tried, as well as many secret nostrums. Variable results have been obtained, and an examination thereof points towards the principles that underlie the successful and profitable application of spraying methods. Among other points it is essential to know :

1. Whether the recommended chemical is applicable in agricultural practice, and whether it causes temporary or permanent injury to the soil.
2. Whether the weeds are the chief sufferers from the application, or whether the latter is liable to cause damage to the crops themselves or to the workmen applying the spray.
3. Whether the expense of any particular chemical, otherwise valuable, fails to justify its use, judging from the increased crops obtained.
4. Whether the spray is useful against annual or perennial weeds, and in the latter case whether the whole or only a part of the plant is killed.

When due consideration is paid to all these points the number of chemical substances that can satisfactorily be utilised for the purpose is reduced to within a comparatively small compass, and much of the experimental and practical work has been concentrated upon these few agents with a view to standardising their conditions of application.

Two methods of utilising chemical weed killers are possible (a) direct application to the soil in order to kill seeds, roots and rhizomes, and (b) application to the aerial parts to prevent seed formation and the assimilation of plant food. With regard to soil application the difficulty arises that substances that are powerful enough to destroy the weeds usually attack the crops also, and therefore the land has to remain uncropped for a period until the effect of the poison has passed off. Consequently mineral plant poisons which break up with difficulty and then possibly give rise to other harmful compounds or elements are out of the question, as the cultivation of crop plants is too long delayed. Easily decomposable organic substances suggest themselves as some of

these pass over afterwards into useful manurial compounds. Experiments, however, go to prove that it is not generally feasible to use chemical compounds to kill seeds or underground parts lying in the soil, though certain substances, as arsenic and sulphocyanate, are useful for suppressing weeds on areas such as garden paths or where no future crop is required. In American tests* for the control of morning glory (*Convolvulus sp.*) poisons were applied to the soil in the vicinity of the roots of weeds, so that it was more or less permeated by the material. The cost per acre worked out at

Arsenic trioxide	39.30	dollars
Sodium cyanide	1,160.60	„
Sulphuric acid	290.40	„

None of these root absorption methods seemed to point the way for the control of morning glory on agricultural land at a reasonable expense and without serious injury to the soil. Arsenic proved to be an excellent soil steriliser, as one set of plots which received 1oz. or more of arsenic trioxide per sq. yd. was bare of all vegetation, barring morning glory, for fourteen months afterwards. Attention is therefore focussed on killing the aerial parts by substances which may either be simple weed killers without any after effects or which may ultimately aid in fertilising the crop after fulfilling their primary function. The method of action of these substances is not always the same. Some are applied in solution to plants in a fairly dry state, the solution being absorbed by the leaves and killing the tissues by direct poisoning. Others are sprinkled over damp plants, abstract more water from the leaves to aid their solution, and thereby cause plasmolysis of the cells of the leaves with their subsequent death. In both cases the best results are obtained with young or rapidly growing plants in which the cuticle is very thin, thus permitting easy ingress or egress of water. Older or very slow growing plants with well developed thick cuticles offer more resistance to the action of the weed killers. Manurial sprays, as sulphate of ammonia, nitrate of soda, kainit, etc., give direct encouragement to the crop in addition to damaging the weeds, and the benefit of their double action has to be taken into consideration when the relative costs of materials are compared.

The question arises as to why it is possible to spray a mixed growth of crops and weeds, killing the weeds but leaving the crop almost or entirely uninjured. The explanation lies in the variable

* Gray, P.H., (1919). Tests of chemical means for the control of weeds. Univ. Cal. Pubs. Agri. Sci. 4. No. 2. pp. 67-97.

position, texture and surface of the leaves of the two classes of plants, and consequently it is only with certain crops and weeds that the desired result can be satisfactorily obtained. Leaves that are covered with a waxy bloom or with a dense mass of fine hairs are very difficult to wet, as any liquid applied tends to collect into globules and roll off, especially if in addition the leaves are carried in a more or less vertical position. Broad outspread leaves devoid of waxy bloom and bearing a certain number of short erect hairs are easily wetted, as the liquid is caught and held by the hairs long enough to enable it to penetrate the tissues. In the same way dry sprays are thrown off by the first class more easily than by the second. Consequently cereal crops and such weeds as grasses and those with dense hairs are more or less immune, whereas certain broad leaved crops, as potatoes and sainfoin, and weeds such as charlock are very susceptible to various chemicals used as sprays. The popular idea is that narrow leaved plants are immune and broad leaved plants are susceptible, but this broad distinction is not quite true as the hairiness, waxiness or smoothness of the leaves are all equally determining factors. This point needs careful consideration when spraying is contemplated, though it is not always possible to predict the immunity or susceptibility of any particular species of crop or weed without experimental trials.

Weed eradication by means of spraying may conveniently be considered in detail from two aspects:—

- A. The effect of sprays upon the growth and development of crops and weeds.
- B. The economic value of spraying, with regard to the relative cost of the process and the increase in the crop obtained.

A. EFFECT OF SPRAYS UPON THE GROWTH AND DEVELOPMENT OF CROPS AND WEEDS.

The ideal weather for wet spraying is dull and dry, without wind, followed by a period without any rain, as these conditions encourage maximum penetration of the leaves by the spray. Too hot sun may dry the solution before penetration has taken place, wind scatters the spray and tends to make its distribution uneven, while rain, following soon after application, washes the poison off the leaves and renders the work futile and wasteful. Wet spraying should be done early in the day, when the dew has dried off the plants, and should be finished several hours before sunset in order that the fluid may penetrate and dry on the leaves before another fall of dew comes to dilute it and to some extent wash it off. Spraying

wet plants is of little value, as the liquid is so much diluted that it runs off the leaves and down the stem without having any opportunity of coming into action. There are therefore, comparatively few days on which spraying can successfully be undertaken and it is important that opportunities should be seized and made the most of whenever they present themselves, in order that the maximum profit may be obtained for the labour and expense incurred.

Dry spraying, on the other hand, should be done very early in the morning, when the plants are wet with dew, or else damp from a slight shower. A certain degree of moisture is needed to hold the powder to the leaves and to begin its solution, more water being abstracted from the leaves themselves, thus causing severe injury. Here again it is important that heavy rain should not intervene too soon after spraying, as the application then fails as a weed killer, even though its action as a fertiliser is not impaired. Charlock (*Brassica sinapis*) is the weed most usually attacked by spraying, as it is so very abundant and wide spread, and yields easily to this means of eradication under favourable conditions. The leaves are rough with scattered hairs and hold the spray well, and it is possible either to kill the plants outright or to prevent them producing seed. As, however, stores of seeds are always present in the soil of an infested area, it may be necessary to repeat the spraying for two or three consecutive years if complete removal of the weed is aimed at, but once cleared, the land should remain clean for a long period unless secondary infection is brought about by the use of impure crop seed. Runch (*Rophanus raphanistrum*), spurry (*Spergula arvensis*) and certain other weeds are more difficult to kill by this means, and usually need rather stronger solutions and even a second spraying in the same season. Opinions vary as to the best time for eradicating charlock. Some authorities recommend spraying when the plant is quite small, with only four or five leaves, while the cereal crop is also in its early stages. Others maintain that the best results are obtained when the charlock is well grown, in full bud and just ready to burst into flower. It is quite probable that tall rapidly growing charlock plants are more susceptible at the later stage, as the leaves are likely to be thinner and more easily penetrated by the spray than in the younger stage when growth is comparatively slow and the leaves are consequently thicker. On the other hand, the crop has to sustain the competition of the weed for a longer period and also it is possible that more damage will be done to the crop by running the spraying machine through at the later stage. It is, however, generally conceded that

spraying should not be done when the plant is at the intermediate or rosette stage, with a mass of leaves produced just before the appearance of the flowering stem. At this stage the leaves are so crowded that a very strong solution is necessary for their destruction and there is danger of a serious scorching of the crop.

Other weeds that can be eradicated successfully by this means will be dealt with under the headings of the various chemical substances used for spraying.

The variety of chemical substances that can be used for weed eradication as an economic proposition is somewhat limited, though experimental work is tending to increase the range, especially for attacking specific weeds which, though in general unimportant, cause trouble in particular districts or under particular conditions of climate or cultivation. In this country copper sulphate is the most widely used chemical, iron sulphate being far less popular, whereas in Germany and America the latter occupies the first place, comparatively little copper sulphate being applied. Sulphuric acid, ammonium sulphate, sodium nitrate and potassium chloride are also used in solution to some extent, while kainit, calcium cyanamide and common salt are occasionally scattered in the dry state to act as weed killers as well as manurial agents.

COPPER SULPHATE.

The value of copper sulphate as a weed killer was discovered accidentally about 1897 by a French vine grower, who, when spraying his vines with Bordeaux mixture found that the leaves of charlock plants in the vicinity were blackened wherever the spray had fallen on them. This chance discovery was followed up and in Great Britain definite experimental work, ranging over many years, was undertaken by certain of the agricultural colleges and county councils. Owing to the variety of seasons in which spraying was tested and the wide differences in climatic conditions at the stations themselves the results obtained were sufficiently numerous and variable to enable definite conclusions to be drawn as to the best conditions for successful spraying. The strength of the spray and the quantity necessary per acre varies according to circumstances, climatic conditions having a direct bearing on the matter. In the drier parts of the country, if spraying is done in suitable weather, 50 gallons per acre of a 3% solution or 40 gallons per acre of a 4% solution represent fair average amounts required to eradicate ordinary charlock (*Brassica sinapis*). In moister climates, such as North Wales, this is only effective in unusually hot dry seasons, and a 4% or 5% solution, applied at 50 gallons per acre, is necessary

for success. Generally speaking, if charlock is very abundant or covered by corn, the quantity, but not the strength should be increased to 75 or 100 gallons per acre, whereas if it is necessary to spray in damp weather or in a moist climate, the strength of the solution should be increased but not its quantity. Runch or wild Radish (*Raphanus raphanistrum*), is not so easy to kill as charlock, and often a second spraying is necessary to eradicate it completely. Spurry or yarr (*Spergula arvensis*) is a more difficult subject, as even if sprayed with a 5% solution of copper sulphate a second growth is apt to spring up from the roots in time to flower and produce seed before harvest time. The leaves of thistles and docks are considerably blackened, and flowering is hindered, but it is not to be expected that such deep rooted plants will be killed by this means. Poppies, on the other hand, appear to have been fairly well eradicated in places where they were trodden down before the application of the spray, which enabled the liquid to reach the underside of the leaves, thus suggesting that spraying after rolling might prove an effective method of dealing with this weed.

Hoary cress (*Lepidium draba*) appears to be susceptible to copper sulphate, 40 lbs. in 80 gallons of water having been used successfully in various cases.

The effect of the copper sulphate spray upon the crop itself needs most careful consideration. Generally speaking cereals are but little affected. In some cases wheat, barley and oats may be slightly checked and show signs of damage to the leaves, but this phase soon passes, recovery sets in. and in some instances the sprayed plants eventually appear to be improved in colour by the treatment. Some experiments indicate that cereals are more liable to discolouration if sprayed in wet weather. Grass and clover sown among cereals are little, if at all affected, and grow more vigorously after the destruction of the dominating weed. Among other crops peas, beans, vetches and mangolds are immune from lasting harmful effects after spraying, even though they may be slightly scorched or checked immediately after application. Swedes and turnips. however, are destroyed in the same way as charlock.

IRON SULPHATE.

As stated before iron sulphate is more popular for weed eradication abroad than at home. It has definite disadvantages in that it cannot be kept in fine crystals without deteriorating, and the large crystals necessarily dissolve slowly, thus causing loss of time in the field. It is an unpleasant substance with which to work, and four or five times as much are required per acre as compared

with copper sulphate. On the other hand, the market price is correspondingly less (copper sulphate £24 per ton, iron sulphate £5 per ton) so that the actual expenses equalise out, and also copper sulphate, especially when supplied in fine crystals, is very liable to adulteration with the cheaper iron sulphate. The same principles apply to spraying with iron sulphate as with copper sulphate, special care being needed in both cases to strain the solution when putting it into the barrel of the spraying machine, to prevent small particles of dirt being carried along to choke the nozzles. The strengths of spray used vary widely and range from $7\frac{1}{2}\%$ to 30%, the latter quantity being clearly excessive. On the whole the 10%-15% solutions give the most satisfactory results, though 20% may be necessary on occasion, the rate of application being 40 to 50 gallons per acre. Charlock is killed, together with young plants of iron weed (*Polygonum aviculare*), hardhead, dandelion, sheep sorrel and poppy, and docks and thistles are blackened, though not destroyed, especially with 20% solution. Ordinary field crops are little affected by the spray. Cereals may show signs of scorching on the leaves at first, but soon outgrow this, while clover and grass seeds are not injured. Pot experiments in Yorkshire with various crops sprayed with 12% iron sulphate, in quantities greatly in excess of that used in ordinary practice, showed that while mustard and charlock were completely killed, peas, beans, beetroot, lettuce, radish and cress were slightly damaged, and a large variety of other crops including cereals were either entirely unhurt or had their leaves slightly scorched or blistered for a time.

Occasionally iron sulphate is used as a dry spray at the rate of 3 or 4 cwt. per acre, but it is less effective when used in this manner and is not to be recommended except where it is desired to eradicate a small dense patch of charlock for which it is not worth while to prepare the wet spraying apparatus.

SULPHATE OF AMMONIA.

The use of sulphate of ammonia in solution as a spray liquid is still in the experimental stage, and up to the present seems to be valuable economically only in special cases, though its use might be more widely advocated if the cost were less. J. Porter (Bucks) and R. G. Gaut (Worcs.), after several tests concluded that at the rate of 2 cwt. in 60 gallons of water per acre it is particularly efficacious against corn buttercup or "starveacre" (*Ranunculus arvensis*), and that it causes injury to far more plants than copper sulphate. Starveacre is most injured when spraying is not done until the weed has just begun to flower, when the plants are

usually killed outright. Porter also found that this year (1924) spraying of starveacre was quite satisfactory when it was delayed till the flowering stage was nearly over and about 80% of the flowers were in "burr," and that sulphate of ammonia is also useful on poor meadow land infested with hardhead (*Centaurea nigra*), ladies bedstraw (*Galium verum*) and yellow rattle. It is less effective than copper sulphate in eradicating charlock unless special care be taken to cover the whole of the plant with the spray, which is unnecessary with copper sulphate. Sulphate of ammonia checks cereals at first, with ultimate recovery, but it cannot be used with many other crops, as beans, peas, vetches and potatoes are all severely injured and clover seedlings are killed. Care is needed as to the time of application, as if an economic return for expenditure is to be obtained, spraying must be done early enough to allow the crop time to make use of the manurial value of the sulphate of ammonia. If applied too late this does not occur, and there is also the danger of delayed maturity or lodging if the crop is heavy. In Germany ammonium sulphate is occasionally sprinkled in the dry state in rainy weather, and has proved effective in eradicating hardhead and sheep sorrel, but also kills such crops as lucerne and bean and young plants of red clover. W. Fenton at Seale-Hayne College has found that applications of 5-12 oz. sulphate of ammonia per 8 square yards are effective in destroying spotted medick (*Medicago maculata*), provided it is applied on a dry, sunny, still day. The larger dressings act more quickly than the small, but in all cases the leaves are ultimately scorched and destroyed.

NITRATE OF SODA.

Experiments with nitrate of soda as a weed killer give variable results and the spray seems to be more uncertain and often less drastic in its action than most of the other substances used. In comparative experiments with 20% solutions of iron sulphate and nitrate of soda respectively, fifteen species of weeds were killed by the former against three by the latter, and the amount of injury inflicted was altogether less with the nitrate. Under certain conditions charlock can be eradicated by this means and an increase in cereal crop obtained with 20% solution, but stronger solutions are no more effective or are even less so, and 10% solutions appear to be of little value. Sometimes even 80 gallons per acre of 20% solution fail to have any appreciable effect on the charlock and the weeds come into flower in due course. On the other hand, a very material increase in crop may be obtained, as is shown by the heavy increase of about 10 cwt. per acre (11 cents) obtained

by spraying with 30% sodium nitrate instead of 10%. (See table, p. 13). Probably the value of this spray is largely influenced by the need of the crop and the soil for nitrogen, the best results being obtained where the need is greatest. If the crop responds to the nitrate manuring its heavy growth prevents recovery of the weeds that are not entirely destroyed by the spray, whereas if the crop is not stimulated part of the charlock tends to recover and eventually flowers. Broad leaved crops, as lucerne, are adversely affected and it is possible that clover and vetches would also be harmed.

KAINIT.

Kainit has proved to be one of the most successful of dry sprays, and it has the added advantage of supplying a useful proportion of potash to the soil. Its killing properties are attributed to plasmolytic action on plant cells, water being withdrawn from the cells to help to dissolve the kainit held on the leaves by dew. The certainty of its action depends largely upon the age of the plants, the area of exposed leaves and the quantity of kainit used. For success it is essential that the kainit be very finely divided, so that 50% will pass through a $\frac{1}{4}$ mm. sieve. It is customary for this purpose to mix it with a small quantity of steamed bone flour or kieselguhr to keep it dry and friable, as if it gets lumpy it is of little use for spreading. The best results are obtained when fine dry kainit is evenly distributed in adequate quantities over young plants moist with dew, and the sprinkling occurs in dry conditions followed by a sunny day and a cool dewy night.

Vetches, peas, beans and clover are injured by kainit, thus precluding its use among these crops, and therefore only cereals can be recommended for treatment in this way. Among the weeds charlock and runch are particularly susceptible, hardhead (*Centaurea nigra*), chickweed (*Stellaria media*), thistles, nettles (*Urtica dioica*) and mayweed (*Anthemis sp.*) are all reported as having been killed by this means, while various other weeds are more or less injured. Spurry, fat hen (*Chenopodium album*) and bindweed (*Convolvulus arvensis*) however, are among the harmful weeds that are immune to the action of kainit.

The effective quantity of kainit ranges from 4-8 cwt. per acre, and if applied in early June will kill charlock without harming barley, while 8 cwt. will kill dead nettle (*Lamium sp.*) without causing any appreciable damage to oats and clover. In this connection it is interesting to note that a 15% solution of kainit applied to oats entirely failed to kill the dead nettle. Larger dressings of 10 cwt. per acre have been found to cause injury to barley. The application

of kainit in this way tends to form a strong crust on the soil, which should be broken up on heavy land sown with winter wheat. It is also suggested that wherever the heavier dressings of kainit are applied a dressing of lime is frequently advantageous.

VARIOUS SPRAYS.

A number of other substances in less general use are applied as sprays in certain areas, but only a few can be mentioned here.

Sulphuric acid is occasionally used, especially in France and America, as a 3% to 10% solution applied at the rate of about 60 to 134 gallons per acre. Weeds such as runch, buttercup, poppies and young thistle plants are killed, but cereals and weed grasses remain uninjured. Bracken can also be cleared from grazing land with a 5% solution, a second dressing being applied when a new crop has sprung up from the underground rhizomes.

Common salt is useful for eradicating yellow rattle in grassland, if 6 cwt. per acre is put on when the seeds are just germinating. On arable land a 20% solution is generally applied at 60 gallons per acre, but it is not advisable to use this spray too often as it may penetrate the soil to such an extent that the growth of all plants, crops as well as weeds, is checked until the salt is washed out by rain. Charlock, thistles and bracken are all susceptible to this spray.

Calcium cyanamide (Nitrolim) gives variable results, as in some cases the weeds recover rapidly from their initial check, though in others about 1-1½ cwt. per acre has successfully eradicated charlock and thistle and the crop may benefit from the manurial value of the application.

B. THE ECONOMIC VALUE OF SPRAYING WITH REGARD TO THE RELATIVE COST OF THE PROCESS AND THE INCREASE IN THE CROP OBTAINED.

I. INCREASE OF CROP DUE TO SPRAYING.

Although spraying has become so widely used in recent years as a method of weed eradication, comparatively few figures are available showing the actual increases in quantity and value of the crops obtained by this means, but where records have been kept, they indicate clearly what a valuable weapon judicious spraying may be when used intelligently. The actual increase in crop must be set off against the cost of spraying in labour and materials and in successful cases the balance is well in favour of a larger profit. In Table I a number of results are incorporated showing actual crop increases of cereals that have been obtained by this means at

various times. In all these instances the market value of the extra crop was much above the cost of the spraying. For convenience of estimating increases the results of the experiments are kept together for each year, instead of being tabulated according to the spraying material used.

Only the dressed grain is included in these figures, the quantities of light grain being omitted. The value of the light grain is an additional asset in favour of spraying, which has not been taken into consideration in any of the following tables.

TABLE I.—TOTAL CROPS AND INCREASES IN CROPS OBTAINED BY SPRAYING.*

LOCALITY AND DATE	CROP	TREATMENT	Crop obtained per acre		Increase due to spraying		
			GRAIN Centals = 100lbs.	STRAW Cwt.	GRAIN Centals = 100 lbs.	STRAW Cwt.	
			(Increase over 10% NaNO ₃ spray)				
Kilmarnock, 1901	Oats						
	(a)	Sprayed with 20% NaNO ₃	23.2	26 $\frac{3}{4}$	4.4	1 $\frac{1}{2}$	
	(b)	" " 30% "	30.4	32 $\frac{1}{4}$	11.6	7	
	(c)	" " 40% "	30.4	33 $\frac{1}{4}$	11.6	8	
		" " 10% "	18.8	25 $\frac{1}{4}$			
Kilmarnock, 1902	Oats.		Centals	cwts.	Centals	cwts.	
	(d)	Once sprayed 3% CuSO ₄	25.00	40	1.80	3 $\frac{1}{2}$	
	(e)	Twice " " "	37.20	50	14.00	13 $\frac{1}{2}$	
	(f)	Once " 5% FeSO ₄	27.80	41 $\frac{1}{2}$	4.60	5	
	(g)	Twice " " "	27.60	44	4.40	7 $\frac{1}{2}$	
	(h)	Once " 10% FeSO ₄	27.00	42 $\frac{1}{4}$	3.80	5 $\frac{1}{2}$	
	(i)	Twice " " "	31.80	44 $\frac{3}{4}$	8.60	8	
	(j)	Once " 20% NaNO ₃	29.00	47 $\frac{3}{4}$	5.80	11	
		Unsprayed	23.20	36 $\frac{1}{4}$			
Kilmarnock, 1903	Oats						
	(k)	Once sprayed 3% CuSO ₄	17.95	40 $\frac{1}{2}$	3.50	6	
	(l)	Twice " " "	18.15	40 $\frac{1}{4}$	3.70	6	
		Unsprayed	14.45	34 $\frac{1}{2}$			
West Aberdeenshire, 1912.	Oats.		Bush.	cwt.	Bush.	cwt.	
	(m)	Sprayed with 3% CuSO ₄	56	47 $\frac{1}{2}$	15	4 $\frac{1}{2}$	
		Unsprayed	41	43			
Moray and Nairn, 1913.	Barley.		Bush lbs.	cwt.	Bush lbs.	cwt.	
	(n)	Sprayed with 4% CuSO ₄	40	20 38	3	32	2 $\frac{1}{4}$
		Unsprayed	36	44 35 $\frac{1}{4}$			

* West Scot. Agric. Coll. Reports 1901-3.
North Scot. Coll. Agric. Leaflets 24, 38.

Critical tests made in Lancashire in 1901 demonstrate clearly the beneficial effect of spraying on the crop yield. Plots of 6 sq. poles each were sown with grass, clover and charlock, lightly harrowed and rolled. The seeds thus did not have the usual

protection of the cereal crop but were exposed to the direct action of the spray. After one or two applications of various solutions at 50 gallons per acre most of the charlock was destroyed, and though the clover was checked at first it completely recovered within a fortnight and yielded a heavy crop. The advantage of a double spraying where the amount of weed is considerable is well shown, especially with iron sulphate, and the reduction in charlock is clearly brought out by the weight of the weed at harvesting.

TABLE II.—EFFECT OF SPRAYING ON WEIGHT OF CROP AND WEED
FROM 6 SQUARE POLES.

Treatment.	Number of Sprayings.	Wt. of clover and grass. lbs.	Increase due to spraying. lbs.	Wt. of dried Charlock. lbs.
3 % CuSO_4	Two	84	68	.7
3 % CuSO_4	One	73	57	3.2
4 % CuSO_4	One	58	42	6.5
12 % FeSO_4	Two	64	48	2.0
15 % FeSO_4	One	29	13	12.25
Unsprayed	None	16		20.75

The effect of kainit on crop yield is well shown by pot experiments carried out with rye and cornflower (*Centaurea cyanus*) and the results obtained with the same material under different circumstances illustrate the need that exists for intelligent appreciation of the mode of action of the spray or powder and the corresponding adaptation of the method adopted. In this particular case the kainit applied before seeding acted directly as a manure, and gave such encouragement to the weed (*Centaurea cyanus*) that the crop was decreased by its competition. Early application to the young plants killed the weeds and enabled the rye to grow without competition and to take full advantage of the manurial value of the kainit. Later applications failed to eradicate the older weeds so thoroughly, and consequently the rye suffered more from competition as well as receiving less manurial benefit from the kainit.

TABLE III.—YIELD OF DRY MATTER IN POT EXPERIMENTS.
(*Remy and Vasters*).

	Without Kainit. g	Kainit before seeding. g	Finely divided Kainit strewn on		
			Feb. 28 g	Mar. 25 g	April 25 g
1.—ON RYE.					
(a) On loam	64.9	53.5	83.5	73.1	67.9
(b) On sandy loam	59.0	56.2	69.6	87.4	84.6
2. ON CENTAUREA CYANUS.					
(a) On loam	34.4	57.2	0.8	0.1	1.8
(b) On sandy loam	43.8	49.3	1.7	3.7	4.2

II. COST OF SPRAYING.

The cost of spraying per acre is exceedingly variable, as it depends upon several factors which in themselves cover a wide range. These include cost of labour (men and horses), price of spraying material, and the proportional cost of the machines used, expressed as wear and tear, repairs, interest on capital, etc.*

The choice of a spraying machine depends largely upon the amount of use it is likely to receive, i.e., upon the extent of the acreage sprayed. Where little spraying is done, knapsack wet sprayers ranging in price from £4.5s. to £6 are available, but as the labour costs are high, owing to the small area that can be covered in a day, this method cannot be generally recommended, though it is useful where it is desired to eliminate dense local patches of such weeds as charlock in fields that are otherwise clean. Pump lances and nozzles for attachment to an ordinary cart cost from £12 to £15 according to the number of nozzles and consequent daily acreage, while horse drawn sprayer pumps driven from the axle are obtainable from £30 to £40, though both the latter types can also be obtained in much more expensive machines. Dry sprays, as kainit and calcium cyanamide, are broadcasted at an average rate of 30 cwt. per day.

Owing to the corrosive nature of many of the spraying materials and the heavy strain put upon the machines in use, the rate of depreciation is rapid and the cost of repairs heavy. The two figures together may be estimated per annum at about 50% of the initial cost for the knapsack wet sprayer, 25% for the cart attachment, and 20% for the horse-drawn sprayer. Reckoning on a basis of 50 acres sprayed per annum, for machines costing £5, £15 and £30 respectively, the cost of depreciation and repairs works out at 1/- 1/6 and 2/5 per acre in each case—thus:

TABLE IV.

Machine.	Cost.	% depreciatn. and repairs	Total cost of depreciation etc.	Depreciation etc. per acre (over 50 acres).
	£		£ s. d.	s. d.
Knapsack Wet Sprayer	5	50	2 10 0	1 0
Cart Attachment ..	15	25	3 15 0	1 6
Horse drawn spray ..	30	20	6 0 0	2 5

If a larger annual acreage is covered, the cost of depreciation becomes relatively less with a consequent decrease in the total

* I am much indebted to Mr. J. B. Passmore, M.C., B.Sc., of Seale-Hayne Agricultural College, for supplying me with detailed figures relating to costs of spraying machines, depreciation, labour, etc., of which summaries are here published.

cost of spraying per acre. This cost varies apart from the material used owing to the variable numbers of men and horses needed. With men and horse labour reckoned at 5/- each per day, the cost works out as follows—

TABLE V.

	Labour.	Cost per day	Acreage	Cost of labour per acre	Depreciation and repairs of spray	Total cost per acre.
Knapsack Wet						
Sprayer	2 men, 1 horse	15/-	1½	12/-	1/-	13/-
Cart attachment	3 men, 2 horses	25/-	15	1/8	1/8	3/2
Horse drawn spray	2 men 2 horses	20/-	10	2/-	2/5	4/5
Broadcasting	1 man	5/-	5 acres at 6 cwt. per acre.	1/-	—	1/-

The total cost of spraying per acre depends not only upon the price of the material used, but upon the strength of the solution employed, and the number of gallons applied per acre. In considering the figures concerned it must always be borne in mind that whereas the cheaper sprays as copper and iron sulphate are merely weed destroyers, with no direct action upon the crop itself, the more expensive materials as sulphate of ammonia, nitrate of soda, and kainit are true fertilisers and under suitable conditions may bring about sufficient increase in crop to justify the heavy initial outlay on spraying. In the following table the costs are based upon the approximate current market prices of the various materials applied at such strength and quantity per acre as would ordinarily be used. From the figures given it is a simple matter to calculate costs where either of these two factors is either increased or decreased.

TABLE VI.—APPROXIMATE TOTAL COST OF SPRAYING PER ACRE.

Material	Cost per ton (approx.) current rates	Rate of applic. of solution per acre	Quantity applied per acre	Cost per acre	Total cost of spraying with cart attachment (3/2) or broadcasting (1/-) per acre
	£ s.			£ s. d.	£ s. d.
Copper sulphate ..	24 0	50 gall. 3% sol.	15 lbs.	3 3	6 5
Iron sulphate ..	5 0	50 gall. 12% sol.	60 lbs.	2 8	5 10
Ammonium sulphate	14 0	2 cwt. in 60 gall. water.	1 cwt.	14 0	17 2
			2 cwt.	1 8 0	1 11 2
Nitrate of Soda ..	13 12	80 gall. 20% sol.	160 lbs.	19 5	1 2 7
Sulphuric acid ..	8 0	60 gall. 10% sol.	60 lbs.	4 4	7 6
Kainit ..	4 0	—	6 cwt.	1 4 0	1 5 0
Calcium cyanamide	14 0	—	1½ cwt.	17 6	18 6

III. INCREASED VALUE OF CROP DUE TO SPRAYING.

Spraying as a method of weed eradication may be regarded from two aspects, as a means of cleaning the ground and rendering cultivation less troublesome and expensive in future years, and also as a means of increasing the yield and value of the crop that is on the ground the year the spraying is carried out. The first aspect of the matter is too often overlooked, and spraying is considered to be a failure in cases where no immediate extra profit is obtained. A little consideration will show that this is a short sighted view. If the result of spraying is satisfactory in so far that the weeds are killed or so severely damaged that they fail to produce seed, it is obvious that future crops will benefit from the extra cleanliness of the land and freedom from weed competition, even though the immediate crop may not be increased or may be so little greater that the increased yield does not cover the actual expense of spraying. This of course does not apply to cases in which failure is caused by rain and bad weather which washes the spray off the weeds before they are damaged.

With successful spraying, however, an increased yield can confidently be expected where sufficient weeds are originally present to come into direct competition with the crop. The first part of the increase must be set off against the cost of spraying, and the extra crop necessary for this purpose will vary with the material used. Calculation based on some of the figures already quoted in this paper may serve to make the position clearer, and current prices of cereals may be taken to provide a working basis.

TABLE VII.—CURRENT PRICES OF GRAIN AND STRAW, OCTOBER, 1924.

		GRAIN.				STRAW.	
		lbs. per bushel.	Price per cwt.	Price per bushel.	Price per cental 100 lbs.	Price per cwt.	
			s. d.	s. d.	s. d.	s. d.	
Wheat	..	60	13 0	7 0	11 7	3 6	
Barley	..	56	17 3	8 8	15 5	3 6	
Oats	.. ..	42	10 7	4 0	9 6	3 8	

Taking the total cost of spraying per acre as already calculated and neglecting the value of any increase in the straw, the actual increases of grain per acre required with the different cereals to cover spraying costs are as follows—

TABLE VIII.

Material.	Spraying costs per acre.			Wheat. bush.	Barley. bush.	Oats. bush.
	£	s.	d.			
Copper Sulphate		6	5	1½	1½	1½
Iron sulphate		5	10	½	½	1½
Ammonium sulphate 1 cwt.	17	2		2½	2	4½
" " 2 cwt.	1	11	2	4½	3½	7½
Nitrate of Soda	1	2	7	3½	2½	5½
Kainit	1	5	0	3½	2½	6½
Calcium cyanamide ..	18	6		2½	2½	4½

TABLE IX.—VALUE OF INCREASED CROP DUE TO WET SPRAYING.

Test.	Strength of spray.	Value of increase.						Cost of Spray.	Increased value due to spraying									
		grain.		straw.		total.												
<hr/>																		
OATS.		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.					
Copper sulphate.—																		
	(d) 3% once		17	1		11	11		1	9	0		6	5		1	2	7
	(e) 3% twice	6	13	0	2	8	7	9	1	7		12	10		8	8	9	
	(k) 3% once	1	13	3	1	2	0	2	15	3		6	5		2	8	10	
	(l) 3% once	1	15	2	1	2	0	2	17	2		12	10		2	4	4	
	(m) 3% once	3	0	0		16	6	3	16	6		6	5		3	10	1	
Iron Sulphate. —																		
	(f) 5% once	2	3	8		18	4	3	2	0		4	4		2	17	8	
	(g) 5% twice	2	1	9	1	6	7	3	8	4		8	8		2	19	8	
	(h) 10% once	1	16	1	1	0	1	2	16	2		5	5		2	10	9	
	(i) 10% twice	4	1	8	1	9	4	5	11	0		10	10		5	0	2	
Sodium nitrate—																		
	(a) 20% once	2	1	9		5	6	2	7	3		*12	11		1	14	4	
	(b) 30% once	5	10	2	1	5	8	6	15	10		*1	2	7		5	13	3
	(c) 40% once	5	10	2	1	9	4	6	19	6		*1	12	4		5	7	2
	(j) 20% once	2	15	1	2	0	4	4	15	5		1	2	7		3	12	10
BARLEY.																		
Copper sulphate.—																		
	(n) 4% once	1	11	0		7	10	1	18	10		7	6		1	11	4	

* Extra over 10% spray.

If the value of the extra straw were taken into consideration the figures would be somewhat lower. The actual increases of crop required to make spraying a profitable measure are therefore quite small in the case of mere weed killers as copper and iron sulphate, but distinctly larger with the manurial sprays, especially in the case of oats. Nevertheless, the increases actually obtained in various experiments more than justify the initial expenditure, when the market value of the extra crop is considered. In Table IX, the money values of the increased crop yields obtained by spraying,

as shown in Table I, are given together with the final profit after deducting the cost of one or two applications of spray. These figures only apply to barley and oats, as none are available for wheat, though similar results might be expected from this crop. The table is rearranged in order to bring together all the figures relating to one spraying material, but the lettering of the experiments corresponds in both cases.

An indication of the increased profit obtained by the use of kainit and calcium cyanamide is given in some experiments by Remy and Vasters; for the sake of clearness the results are given in English nomenclature, reckoning 1 hectare = 2.4 acres, and 1 mark = 1 shilling. In this case the grain is reckoned at the exceedingly low value of about 8/- per cwt., and therefore at current rates the extra value of the crop would be considerably greater.

TABLE X.—VALUE OF INCREASED CROP DUE TO DRY SPRAYING.

Treatment per acre.	Crop in cwt. per acre	Increase of crop due to treatment.		Cost of treatment per acre.			Value of increased crop over cost of treatment.		
		Grain cwt. per acre	Value per acre						
Kainit, 6cwt. applied early	42½	11½	£ s. d. 4 11 8	£ s. d. 1 1 3	£ s. d. 3 10 5				
Kainit, 6cwt. applied late	38½	7	2 17 11	1 1 3	1 16 8				
Calcium cyanamide 120 lbs. ..	43½	12	4 18 9	11 8 3	4 7 6				
Untreated	31½	—	—	—	—				

The above figures for increased crop value, based as they are on actual results obtained under ordinary field conditions, demonstrate clearly how profitable a measure spraying may be, whether it be done with ordinary weed killing agents or with manures. Many of the increased values cited are very considerable, but even in cases where they were much lower spraying would be a profitable proposition, especially if large areas were brought under treatment. At the present time, when agricultural profits need more than ever to be improved, such a promising means as that afforded by spraying should not be neglected, and if the necessary conditions are observed and the weather is not too unpropitious, there is little doubt that the results will justify the expenditure of time and money.

A final suggestion may be made with regard to the co-operative ownership of spraying machines. This, if possible, should be avoided

on the larger farms, as it is so very important for successful work that the utmost should be made of ideal weather conditions. In our climate there are all too few days in the year when the weather is favourable and the crop is in the best condition for spraying at the same time, and such days should be made the most of. If spraying machines are shared amongst several owners this is not possible, and much work has to be done under less suitable conditions with less chance of success. Therefore, even with the more expensive machines, it is best to have individual ownership, but with the liberal allowance made for depreciation in calculating the cost of spraying, this does not imply locking-up capital for very long, as the cost of the machine is refunded over a very short period of years. Where, however, only a few acres have to be treated annually on small farms, co-operative ownership will often enable spraying to be carried out in cases where the smallness of the area would not justify the expenditure of capital on a machine for each farm.

II.—THE CAUSES OF VARIATIONS IN MILK RECORDS.

By John Hammond and H. G. Sanders
(*School of Agriculture, Cambridge.*)

If we examine the average milk yields given by cows in the different Milk Recording Societies each year we see that some districts give low yields regularly and others just as regularly give high ones. (See Table I). Incidentally the increase in the average yield per cow during these five years shows in a marked way the value of milk recording to members of these Societies.

Let us examine the possible causes for the variations in yield in the different districts. The first and most obvious explanation is that the Agricultural conditions vary, but before we examine these one or two other possible causes will be mentioned.

The breed of cattle which is kept may influence the result. We have not figures to show the distribution of breeds in each Society, but in Norfolk several different breeds are kept and so it was possible to obtain an average figure for each breed in this district (see Table II).

TABLE I.

RELATION OF AVERAGE MILK YIELD TO ARABLE LAND.

Milk Recording Society.		Average Yearly Yield in lbs.						Acres arable to one acre pasture.
Name.	Letter.	1918-19	1919-20	1920-21	1921-22	1922-23	5 yrs. av.	
Essex	O	6294	6981	7263	7166	7499	7041	1.98
Yorkshire ..	N	6458	6747	7043	7420	7333	7000	2.21
Norfolk	AB	6292	7055	7207	6810	7601	6993	3.02
Cambridgeshire	V	6173	6470	6940	7248	7415	6849	3.98
Kent	W	5883	6657	7053	6966	7200	6752	0.81
Suffolk	K	5976	6636	6759	6790	7365	6705	3.14
Sussex (East) ..	AR	5676	6806	6711	6841	7311	6669	—
(West)	AY	—	6883	6859	6925	7255	6980	—
(Average) ..	—	5676	6844	6785	6883	7283	6694	0.69
Gloucestershire—								
(Campden Mtn.)	AS	6146	7204	6670	6328	6940	6658	—
(Cotswold) ..	BB	—	6638	6950	7564	7474	7156	—
(Gloucester & Dis.)	AD	5947	6520	6222	6682	6848	6444	—
(Average) ..	—	6046	6787	6614	6858	7087	6678	0.58
Derbyshire (Derby and District)	U	6025	6601	6560	7049	7329	6713	—
(Peak)	C	6107	6614	6453	6829	7004	6601	—
(Average) ..	—	6066	6607	6506	6939	7166	6657	0.27
Nottinghamshire	S	5755	6897	6878	6810	6821	6632	1.11
Shropshire	AM	5765	6260	6895	6772	7309	6600	0.50
Berkshire	AH	6125	6704	6468	6580	6845	6544	1.12
Wiltshire—								
(Warminstr&Mere)	BA	—	6395	6108	6434	6849	6446	—
(North-West) ..	AK	6118	6541	6198	6438	6902	6439	—
(Salisbury & Dis.)	AN	5814	6522	7022	7108	7524	6798	—
(Average) ..	—	5966	6486	6443	6660	7092	6529	0.76
Hampshire	Z	5775	6584	6598	6608	7014	6528	1.59
Mtn. Mowbray & Dis.	B	6313	6639	6839	6063	6682	6507	0.34
Surrey	AF	5868	6451	6746	6646	6796	6501	0.75
Worcestershire ..	H	5825	6110	6601	6556	6948	6408	0.56
Allendale(Nrthmld)	AG	5603	6292	6294	6775	7034	6400	0.42
Northamptonshire	AC	6226	6399	6391	6312	6668	6399	0.52
Cheshire	G	5699	6308	6092	6639	7152	6378	0.64
Oxfordshire	M	5957	6454	6128	6390	6950	6376	0.98
Lancashire	X	5657	6314	6418	6703	6735	6305	0.53
Somerset—								
(Bristol and Bath)	AP	—	5970	5955	6664	7281	6467	—
(Cadbury)	A	5755	6266	6123	6336	6741	6244	—
(Frome)	BL	—	—	6024	6211	6431	6222	—
(Highbridge) ..	AE	5922	6470	6123	6467	7048	6466	—
(North)	D	5940	6282	6093	6538	6998	6350	—
(Shepton Mallet)	BC	—	5742	6080	6017	—	5946	—
(Yeovil)	Y	5774	7006	6158	6424	6749	6422	—
(Average) ..	—	5848	6289	6079	6380	6838	6291	0.29
Herefordshire ..	A	4998	6187	6456	6763	7026	6286	0.48
Devon(South&Dis.)	AL	5300	6061	5747	5856	6309	5876	—
(East)	AW	—	5351	5584	6054	6716	5928	—
(Average) ..	—	5300	5706	5665	6005	6512	5838	0.78
Ombld.&N.Wstmld.	P	5362	5501	5690	5971	6089	5723	0.58
Kendl.&S.Wstmld.	E	4853	5396	5912	6011	5841	5603	0.23
Average of all Soc. running for the full 5 yrs. (33 Socs.)		5860	6483	6508	6638	6967	6491	—

TABLE II.

THE AVERAGE LACTATION YIELDS OF ALL COWS OF DIFFERENT BREEDS IN NORFOLK.

Breed.	No. of Lactations.	Average yield in a Lactation
Friesians	383	7899 lbs.
Mongrels	1661	7071 ..
Friesian Crosses	315	6918 ..
Non-Pedigree Shorthorns	228	6700 ..
Red Polls	642	6639 ..
Lincoln Reds	476	6629 ..
Park	71	6377 ..
Pedigree Shorthorns ..	104	5986 ..
Jerseys and Guernseys ..	38	5816 ..

It will be seen that except for the Friesians the mongrel Shorthorn cattle are better milkers than any of the pure breeds. There seems to be little doubt that among herds of pedigree cattle of all breeds many animals are kept for their pedigree value alone and not for their commercial, the owner hoping that they will breed something which may be of value. Although this may happen yet the continuity of the line of descent from a milking ancestry is broken by such animals and their offspring, although possibly good milkers if mated to a good bull, will be more likely to throw non-milkers than those which have an unbroken line of milk behind them. Among pedigree animals bred for milk we cannot be too drastic in weeding out those which do not come up to a commercial standard of efficiency. The best breeders do this, but they sell their "culls" to second-rate breeders who hang on to them for their pedigree value hoping to sell their offspring on the strength of this pedigree.

As the Mongrel Shorthorn forms the bulk of the commercial animals of the country and as the other breeds, more particularly the high yielding ones, are widely distributed breed differences cannot explain the whole of the variation which exists among different Societies.

The next point to consider is the time of year that the cows calve. It has been found from a study of two Milk Recording Societies that cows which calve during the autumn and winter months yield more milk on the average than do those which calve in the late spring or summer (see Table III).

TABLE III.

TOTAL AVERAGE YIELD FOR COWS CALVING IN THE DIFFERENT MONTHS OF THE YEAR (IN LBS.).

Cows calving in :	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Norfolk ..	7081	7218	6953	6993	6649	6389	6567	6522	6667	7099	7111	7375
Penrith ..	5808	5169	5625	5420	5343	5384	5396	5949	5831	5877	6077	5604

The causes for this will be dealt with later, but the problem now to be faced is whether the distribution of calving causes the difference in the average yield of the various districts. The percentages of cows which calve in different months of the year for several districts are shown in Table IV.

TABLE IV.

THE PERCENTAGE OF COWS WHICH CALVE IN THE DIFFERENT MONTHS OF THE YEAR.

Milk Recording Ttl. No. Soc. or District. of Cows	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
S.E. Essex M.R. Soc. 1157	12.9	10.2	8.8	0.5	5.9	8.0	8.0	*6.9	*7.3	6.4	9.5	9.6
Norfolk M.R. Soc. 1799	11.0	13.3	11.2	9.4	7.0	6.2	8.6	*5.9	*5.0	5.6	7.4	9.4
N. Somerset M.R. Soc. 844	10.6	9.9	13.5	11.1	6.3	4.7	5.5	*4.7	*8.1	11.1	7.7	6.8
Penrith (Cumb.)												
Average of 4 M.R. Socs. 5263	11.3	11.5	13.8	11.3	7.4	6.1	6.6	*4.8	*5.1	6.4	7.2	8.5
Essex (Gavin) 1418	9.6	12.4	7.4	5.1	6.1	9.8	10.8	7.9	4.7	8.8	7.3	10.1
Yorkshire (Wilson) 484	10.5	10.7	12.0	10.3	8.0	5.6	5.0	6.6	8.7	7.7	6.6	8.3
Ireland (Wilson) 811	10.2	13.4	14.9	14.6	8.8	3.1	2.6	5.6	5.4	9.1	6.3	6.0
Ayrshire (Tocher) 3893	9.7	16.7	24.4	16.8	7.1	2.6	1.0	2.1	4.6	4.8	4.5	5.7
Denmark (Petersen) 1472	7.6	9.5	11.8	9.6	7.1	5.6	2.9	5.0	7.1	10.5	12.8	10.5
	with Dec										with Jan.	
Germany (Hansen) 10960	18.1	40.5		16.2	6.4		6.7			12.1		

* Too low as not all service dates given in records.

It will be seen that spring calving is much more frequent in the west (Penrith and North Somerset) than it is in the east (Essex and Norfolk). When allowance is made for the differences in the distribution of calving the corrected averages for the four Societies are as follows:—Norfolk 6897 lbs., Essex 6749 lbs., Somerset 6163 lbs., and Penrith 5915 lbs. Although these figures are nearer

24 HAMMOND & SANDERS on Causes of Variations in Milk Records.

together than those given in Table I yet they are wide enough apart still to show that another cause exists.

Before leaving this aspect of the question it may be pointed out that there is a natural tendency everywhere for cows to calve in the spring. In the wild state it is their natural calving season. This means that service is easiest in May, June and July and Table V, which shows the average time between calving and service for cows calving in different months of the year, supports these conclusions. It should be noted that in order to calve at the same time in the following year a cow should be served 85 days after calving.

TABLE V.

THE INTERVAL BETWEEN CALVING AND FERTILE SERVICE FOR COWS
CALVING IN THE DIFFERENT MONTHS OF THE YEAR.

DAYS + — THE AVERAGE INTERVAL.

Milk Recording Society.	Aver. Intervl days	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
S. E. Essex ..	103	-3	-7	-10	-19	-27	+1	-1	+10	+32	+23	+5	+2
Norfolk ..	89	-3	-4	-9	-12	-13	-15	-14	+4	+26	+30	+11	+1
N. Somerset ..	92	-8	-6	-5	-17	-13	-1	+4	-7	+20	+21	0	+15
Penrith (Cumberland) ..	105	-5	-12	-14	-24	-31	-16	-12	-11	+74	+48	+7	+3
Average ..	97	-5	-7	-9	-18	-21	-8	-6	-1	+38	+30	+6	+5

It is this delay in the service of cows calving in the late autumn months which is a serious loss to milk producers. The milk seller wants a regular supply of milk for his customers and if delay occurs in service he will have to buy in down calving cows at a time when they are expensive or will have to lose part of his custom. This widespread temporary sterility of cows calving in the autumn is of greater economic importance than the occasional cases of more permanent sterility which occur from time to time in any herd. The reason for this delay in service has been investigated and it was found that cows remained on heat for a shorter time in the winter months than during the summer. Heat periods of 6 and 10 hours were common in November and December, while in June and July they were seldom less than 16 hours and often continued up to 30 hours. In winter the men's working hours are short and heat periods of 6 and 10 hours are easily missed if they occur in the night; moreover, at this time of year the symptoms of heat

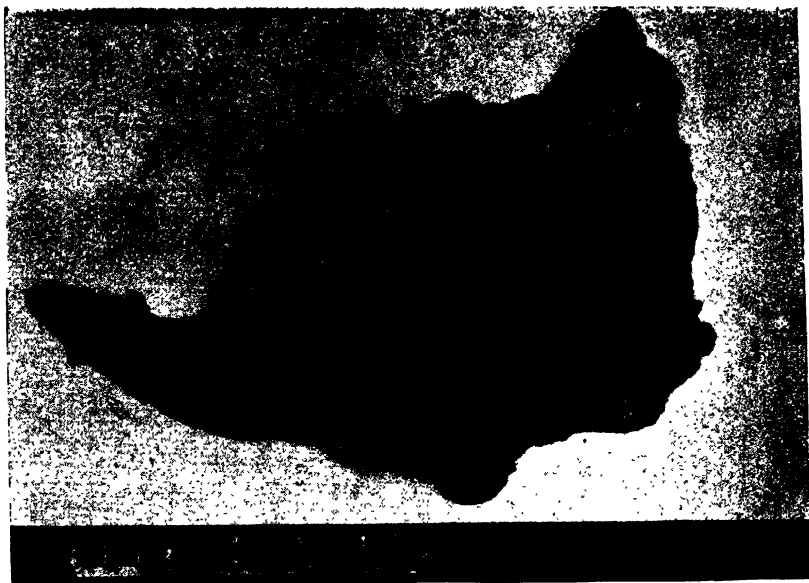


FIG. 1.

Udder of Maiden Heifer—vertical section, through one side. The milk secreting portion is stained black and the fat is white.

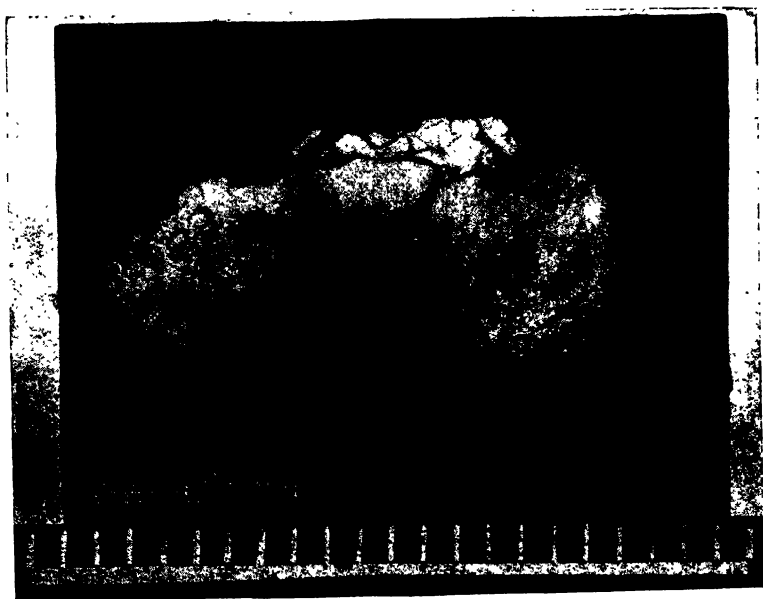


FIG. 2.

Udder of Heifer—pregnant 3 months.



FIG. 3.
Udder of Heifer—pregnant 5 months.



FIG. 4.
Udder of Heifer—pregnant 8 months.

are not so marked as in summer. It was found that in Penrith the average delay in service varied considerably from month to month, but in Norfolk the service period was more regular throughout the year. In many districts where the cows are tied up in the stall all the winter the heat periods, even if they occur in the day, can be easily overlooked and it is often not until the cows are turned out that the heat is noticed by their jumping one another. It would appear advisable in such cases either to allow the animals to run out in a yard for a few minutes the first thing in the morning and the last thing at night, or else to lead a young bull down the stall at these times. Heifers frequently, but cows rarely bleed from the vulva about two days after they have been on heat, and if a period has been missed this forms a useful indication of when they will next be in season and a closer watch may be kept on them at this time or they may be shut up in a yard with the bull at nights. The average time between one heat period and the next was found to be 19-20 days, but individual and other variations occurred, the range being from 16 to 24 days. In order to bring a cow on heat at any desired time various drugs have been recommended, but those tried were without effect. Heat can, however, be brought on in two days by the operation of squeezing out the Corpus luteum or yellow body from the ovary, this however requires Veterinary assistance.

This subject of the time of service after a cow calves leads us to another aspect of our problem, viz., as to the effect of this on her milk yield in that lactation.

It is well-known that many big records have been made by leaving cows unserved, and while this practice may be a good one when the cow is being sold to the butcher from a town dairy, yet on the whole it is unsatisfactory, for although the cow gives a large yield in that year her yield in the subsequent year is a low one and if a cow is "balked" too often she is frequently difficult to get in calf when it is wanted to breed from her. In issuing certificates of yield the Ministry of Agriculture state the date of the last calving and the date of the next calving and this will show whether the record is to be taken as it stands or whether allowance has to be made for the fact that the cow has been a long time unserved. Both Gavin and Wilson have given us facts which bear on this point and have shown that the cow after she is served drops in her yield suddenly at about the 20th week after service. If service occurs soon after calving the drop at the 20th week comes early in her lactation period and her yield is reduced; if she is not served, until late then the drop may not occur within the year and

she gives a large yield in that year. Table VI which has been based on figures supplied by the Penrith and the Norfolk Milk Recording Societies* shows the average yield given by cows served at different periods after calving and also the corrections we should add or subtract to compare the yield with that of a normal cow served 85 days after calving so as to calve at the same time in the following year.

TABLE VI.

EFFECT OF THE TIME OF SERVICE AFTER CALVING
ON THE YIELD IN THE LACTATION.

Days served after calving	0-19	20-39	40-59	60-79	80-99	100-119	120-139	140-159	160-179	180-199	200-119
Yield	Norfolk 5368	5884	6346	6760	7130	7462	7759	8025	8263	8476	8667
in lbs.	Penrith 4427	4770	5084	5372	5635	5876	6097	6300	6485	6655	6830
Corrcn. to	%	%	%	%	%	%	%	%	%	%	%
Apply	+31	+20	+11	+4	-1	-5.5	-9	-12	-15	-17	-19

It is believed that the reason for the drop in yield which occurs at the 20th week (5th month) of pregnancy is due not so much to the demands of the foetal calf as to changes which take place in the udder, which at this time starts to grow in preparation for the next calving. A maiden heifer and a heifer in calf for the first time up to the 5th month often have a watery fluid in the teats, but at this stage (20th week) the secretion changes to a thick honey-like secretion. Incidentally the presence of this secretion forms a useful indication of pregnancy from the 5th month onwards. It is this thick honey-like secretion which, mixed with the milk formed at a later stage, produces colostrum or beastlings and since it is rich in antitoxins it is of great value to the newly born calf. Sections through the udders of heifers have been made and stained so as to show how the gland tissue grows. In a maiden heifer (Fig. 1) the udder consists mainly of fat with a few milk ducts scattered through it; at the 3rd month of pregnancy the appearance is much the same (Fig. 2), but at the 5th month the ducts begin to swell out and form the milk secreting tissue (Fig. 3) and by the 8th month the milk secreting tissue is well formed and has replaced most of the fat in the udder (Fig. 4). It would appear that it is this growth stage beginning at the 5th month which is responsible for

*We are greatly indebted to the members of the Penrith and Norfolk Milk Recording Societies for their kindness in allowing us the use of their books.

the drop in the yield of milking cows at this time, for the gland cannot both grow to full extent and secrete milk to full extent at the same time,

This brings us to a consideration of the dry period ; the use of which is not only to allow time for the gland to grow unchecked, but also for a heavy milking cow to get into good flesh again. While the best length for the dry period probably depends partly on the way the cow has been fed during the previous milking, yet there are very few actual figures on this point which can be quoted. The Norfolk records for dry periods have not yet been worked out, but the figures for the Penrith Society show that if the cow was dry less than 40 days she gave on the average 13% less than usual during the next lactation period. For dry periods beyond about 6 weeks there was little if any advantage gained and it would appear that this period would, under average conditions be sufficient.

Since both the time of service and dry period tend on the whole to be shorter in the East of England arable districts than in the West of England grass districts it will be evident that these factors if anything operate in the opposite direction and are not the main causes of the different yields in the different Societies although they may in part account for some of it.

It is well-known that the age of the cow affects her yield and that where milk yield qualifications for entry in a register are laid down different standards are required for heifers and for cows. The records from Penrith show that the maximum yield is attained with the 5th calf and that on the average 30% has to be added to a first calf heifer's yield to bring it up to this maximum. For a second calver 18% must be added, 10% for a third calver and 4% for a fourth calver. In a few districts such as Penrith where the sale of milking cows before their prime rather than the sale of milk as such constitutes the main source of income it is probable that low yields will be caused by this factor.

It remains to be discussed how it is that cows calving in certain months of the year give higher yields than in others, and in order to find this out we must compare their lactations week by week. Fig. 5 shows average lactation curves for cows calving in November and for those calving in June in the Penrith district.

The June calver gives a lot of milk at first (250lbs. per week) while the November calver never gets much beyond 200lbs., and yet the June calver only yields 5384lbs. in the lactation as compared with a yield of 6077lbs. for the November calver. This shows how easy it is for a man who does not keep milk records but who judges a cow by what she gives at her best to go wrong in his judgment.

FIG: V (a)

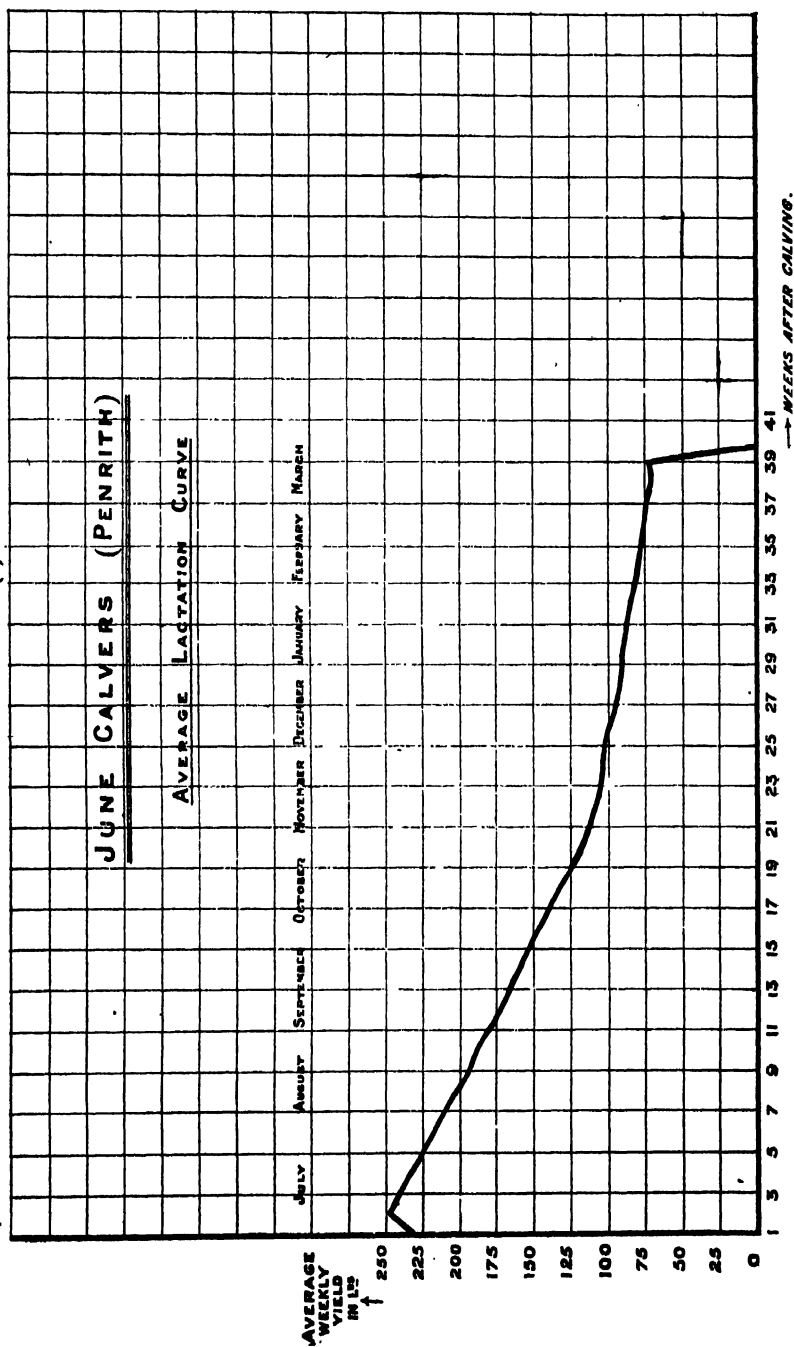
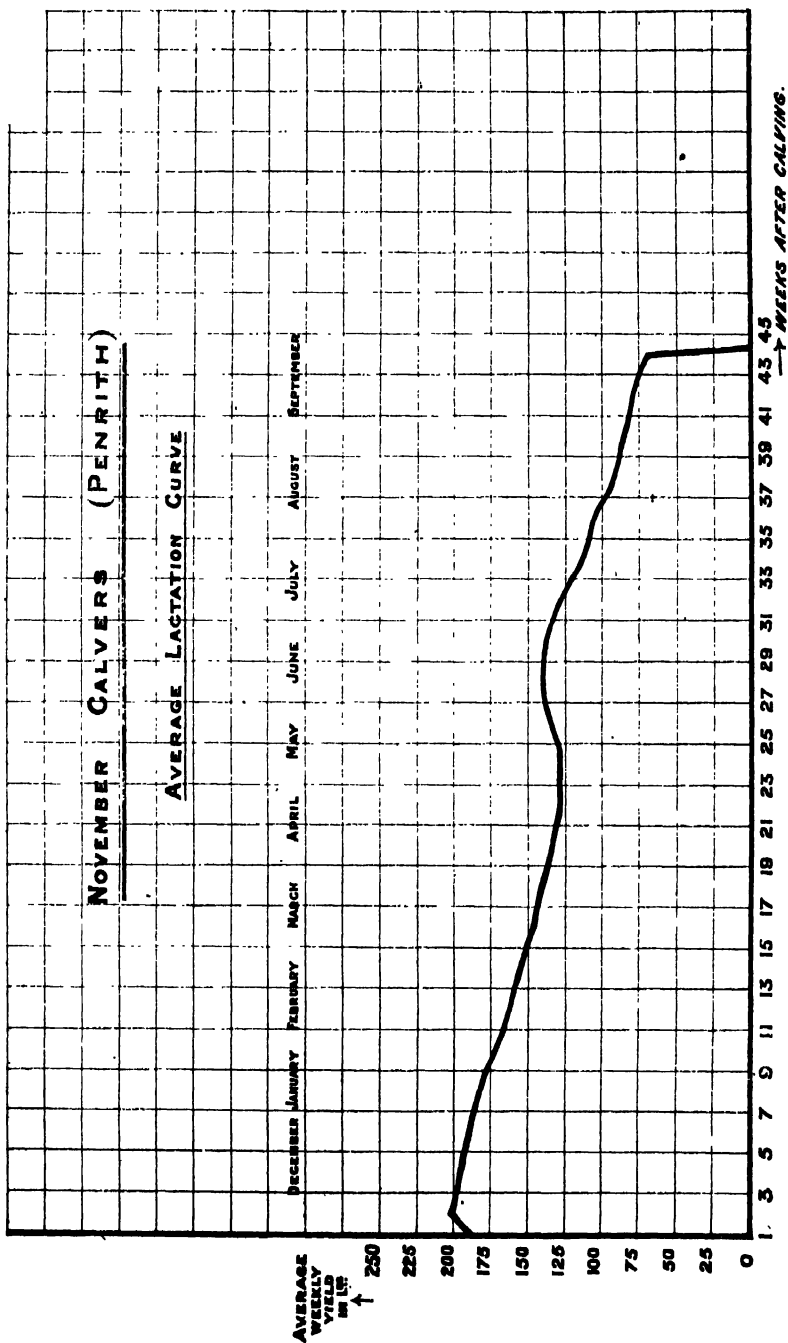


FIG: V (b)



To return to the explanation of why a cow calving in November gives a higher yield than a June calver; the June calver comes down on the spring flush of grass and milks well at first, but in July and August the grass grows old and she falls off rapidly in her yield and continues to do so when put on winter feed, being dry by February 39 weeks after calving.

The November calver on the other hand comes down on winter feed and milks fairly steadily throughout the winter: just as she begins to drop off in her yield she is turned out to grass in May and the flow is increased so that she milks longer, not drying off until the 44th week.

It will appear from this that certain times of the year are better for milk secretion than others and that the best time is the period of fresh grass in the spring. What the farmer does at other times of the year is to supply food as a substitute for this. On the way in which this substitute of food is made depends his success as a milk producer and we believe that much of the difference in the average yields of different Societies is due to the cow foods produced and fed in these districts as substitutes for the spring grass at other times of the year. In the feeding of two or three thousand-gallon cows the owner feeds a better substitute than the original grass all the year round, but under ordinary commercial conditions the problem is how to make this substitution economically.

Looking at the subject broadly, purchased cakes and meals are available in every district equally but the produce of the farm varies enormously. Since the purchased foodstuffs are bought to balance the foodstuffs grown on the farm the purchase of foodstuffs can be minimised if suitable crops are grown. The produce of the farms in the West, more especially in certain districts, is grass and meadow hay only. while in the East off arable land roots, seeds hay and catch crops are available. If we look at Table I we see that the Societies in arable districts are grouped at the top with high yields while those in grass land districts, with a few exceptions, are at the bottom with low yields. There is then strong evidence that roots and catch crops are a more efficient substitute for young growing grass than is hay alone. If we consider the properties of young growing grass we find that it is non-fibrous, *i.e.*, it is not bulky Meadow hay especially if it be cut late is so bulky and fibrous that a heavy milking cow cannot eat enough of it per day to supply the demands of the milk flow and the latter suffers. Roots are not such a bulky food as hay for a large proportion of them consists of water which easily passes through the wall of the digestive tract and is absorbed making room for more. While with hay the fibre

blocks the tract and a full stomach satisfies the animal's appetite and she does not become hungry again, even though the milk glands require more nutrients. Constipating and laxative diets behave much in the same way.

It should be pointed out that Table I includes only those Societies which have been going five years or more. Buckinghamshire with a three year average comes out with a high yield but has a low acreage of arable. Derbyshire also appears high on the list for a grassland district. It is probable that these exceptions are due to the use of more concentrated food or distillery slop or other special methods of feeding in these districts.

In some grassland districts it has been found that by cutting down some of the bulk, by giving less hay or by cutting the hay earlier or by substituting cheap cakes and meals often soaked in water, a better milk yield can be obtained. In the purely grassland districts of Friesland stack silage made from the young aftermath forms a supply of succulent non-fibrous food during the winter months and it might be found very useful in some districts in England where roots are difficult or expensive to grow. In some districts wet brewers' or distillers' grains are available and the addition of these to the winter ration adds considerably to the milk flow. When straw chaff has to be fed, soaking it for several hours with treacle and water before feeding is often practiced and this in arable districts forms a substitute for roots when these are short or not available.

One of the commonest mistakes made by farmers in feeding cows is that of giving approximately the same ration of cake or meal to every cow in milk and not according to the yield they give. This occurs so frequently that one can generally pick out the heaviest milking cows in the shed by their poor condition. If these cows were given extra cake and meal (they cannot eat more hay for want of stomach accommodation even though it is given *ad lib*) we should hear less of high milk yield undermining the cow's constitution.

Fig. 6 shows for each month for Penrith and for Norfolk the yield of milk one might expect from a cow if the whole of her lactation took place in one month in the year, or in other words it gives the value of each month for milk production. This value will depend very largely on the foods available in each month and such a table shows the farmers in these districts the bad times of year for milk production and so opens the way for experiments in improving the yield at these bad times.

Fig. 7 puts the case in a slightly different way; it shows how much the cows fall off in yield from the beginning to end of any

FIG: VI.
YIELD DURING DIFFERENT CALENDAR MONTHS.

NORFOLK ———
PENRITH - - - - -

MEAN
WEEKLY
YIELD.
(lbs)
↑

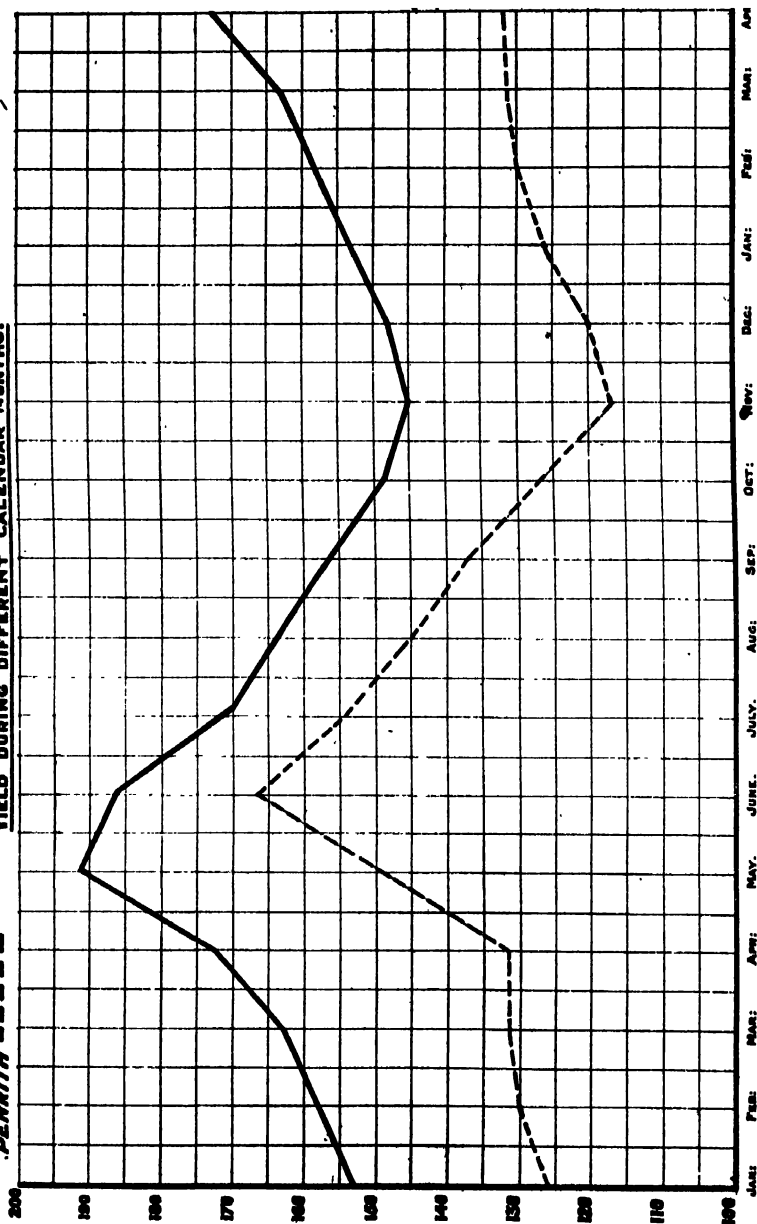
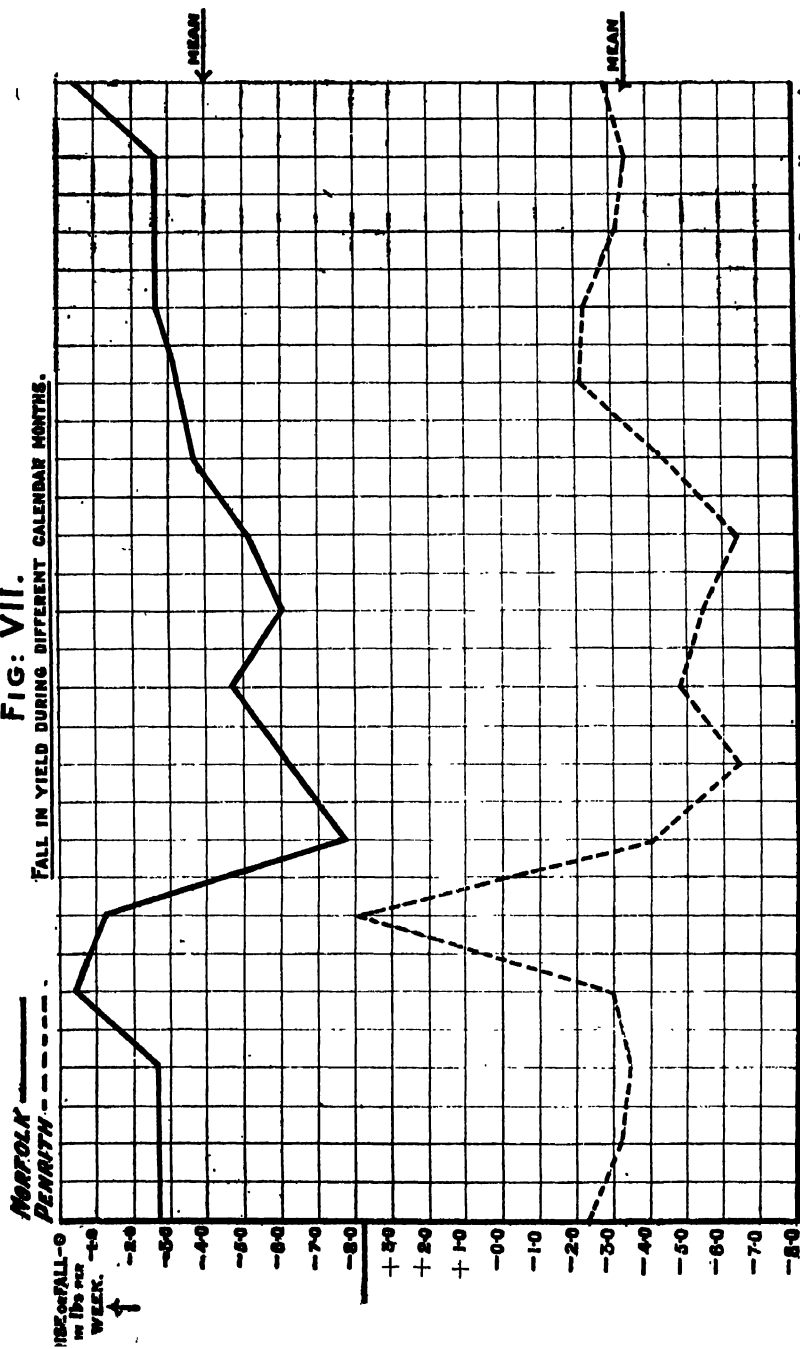


Fig: VII.
FALL IN YIELD DURING DIFFERENT CALENDAR MONTHS.



month. After the May and June flush the yields fall off rapidly in July and August, although the grass may be plentiful at this time it is fibrous and often dry. The provision of vetches, lucerne, etc., or movement of the cows to a field which has been cut very early for hay so that there may be a good aftermath will assist in keeping up the flow and is especially useful to those who have a seaside trade.

In conclusion, it should be pointed out that the remarks on milk records which have been made above are very largely based on a study of the Penrith and Norfolk records. The most favourable time for calving to obtain the largest yields will no doubt vary in each locality. Examination of Table III will show differences in this respect; in this case it is probably mainly due to the poor conditions for milk production which exist in the Penrith district during February, March and early April. It is believed, however, that the general trend is the same in all districts, *i.e.*, high yields from late autumn and winter calvers and low yields from spring and summer calvers, but the exact details which are so important practically can only be obtained by a study of the records in each district and until this is made no absolute statement can be given.*

III.—RECENT DEVELOPMENTS IN COMMERCIAL FRUIT CULTURE.

By Ernest M. Bear.

The years that have elapsed since the war have seen many changes in commercial fruit culture. Some of these changes are mere variations of methods to suit altered conditions with regard to labour and its cost. Others are distinctly on the line of progress.

Several influences have been at work to bring about these developments. The research stations and the Ministry of Agriculture have played an important part. The Federation of British Growers

*For further details on various points mentioned the reader may be referred to the following papers:—

GAVIN.—The interpretation of milk records, *Journ. Roy. Agric. Soc. of England*, vol. 73, 1912, p. 153.

WILSON.—Variations of Milk Yield with age and the length of the lactation period. *Sci. Proc. Roy. Dublin Soc.*, vol. 17, No. 12, 1922.

HAMMOND and SANDERS.—Some Factors affecting Milk Yield. *Jour. Agric. Science*, vol. 13, part 1, 1923.

WOODMAN and HAMMOND.—Composition of Secretions obtained from the udders of heifers during Pregnancy. *Journ. Agric. Sci.*, vol 13, part 2, 1923.

HAMMOND.—Reproduction in the Cow. *Journal of Agricultural Science* (in preparation).

and the National Farmers' Union have undertaken the uphill task of organising growers with a considerable degree of success. New men of intelligence and energy have come into the industry, and have shown themselves very ready to adopt new ideas.

In this article I propose to describe some of the developments that have taken place in the various operations involved in the culture of fruit for market.

MODERN PLANTATIONS.

Although standard trees are still planted in some districts, where the ultimate object is to grass down the orchard for grazing with sheep or cattle, or where the culture of vegetables and flowers between the trees is of greater importance than fruit production, the modern tendency is to plant trees with heads closer to the ground. The advantage of this is that pruning, spraying, thinning, and picking can all be done with greater ease and economy. At the same time, there are objections to the old-fashioned tree of bush form, branching almost from the ground level. Most nurserymen now supply bush trees on a stem 1ft. to 18ins. high; and this is a very suitable form for "filler" trees on very dwarfing stock to plant temporarily amongst standards. As permanent trees there is a tendency to prefer what may be termed either bushes on a leg or low half-standards, the stem being about 3ft. high. Trees of this form are low enough to allow of all operations being performed with reasonable ease, and yet are high enough to permit of soil cultivation by motor or horse-drawn implements. Moreover, the stem is long enough for grease-banding and for protecting against rabbits with wire netting guards. Pigs or poultry may also be run in an orchard of such trees, if desired.

Trees of the form described are obtainable from a few nurserymen, but the usual form of half-standards is taller, having a stem about 4ft. 6ins. high. It is an easy matter, however, to form bushes on a 3ft. stem if maidens are planted in the first instance; or a suitable batch of two or three-year-old feathered trees may sometimes be secured. Stakes are, of course, required for trees of this form.

Very many old orchards suffer from having the trees overcrowded, and a good deal more space is being allowed between permanent trees in modern plantations. I have under my management a good many bush trees, on some form of paradise stock, planted 12ft. apart some 20 years ago, and most of them are hopelessly overcrowded now. This is too close together for anything except bushes on the most dwarfing of stocks, such as *Jaune de Metz* for apples. I now plant bushes on a 3ft. stem 18ft. apart each way;

and this would hardly be enough space for strong-growing varieties on really good soil. The importance of plenty of space can hardly be over-emphasised. If the trees are crowded they tend to run up too high, and in time they bear chiefly on the tops. Any fruit borne lower down lacks colour through want of exposure to sunshine, and it is more liable to be affected by fungus diseases, the spread of which is favoured by the close, moist conditions amongst the crowded branches. Drastic cutting back to keep the trees within bounds is undesirable, because it leads to a lot of unwanted growth and possibly to trouble from silver-leaf and other diseases. It is much better to give permanent trees ample room, and to utilise the space between in the early years of the plantation, for "filler" trees on very dwarfing stock or for soft fruits such as currants and gooseberries.

STANDARDISED STOCKS.

Those who are planting commercial apple orchards in the present day have the great advantage that they can, if they wish, obtain trees worked on stocks standardised as a result of the now world-famous work of classification done at the East Malling Research Station in Kent. Apple trees worked on three of the selected stocks are already being offered by nurserymen. Malling Type I, represented by River's Broadleafed English Paradise, is a vigorous stock suitable for very large permanent bushes, and strong enough for bushes on a 3ft. stem, such as I have already described, or for half-standards. The East Malling authorities say that such varieties as Bramley's Seedling on this stock, upon a medium soil, might well be planted 24ft. to 30ft. apart. The stock approaches a "free" stock, and is therefore suitable for bush trees of prolific varieties like Stirling Castle and Lane's Prince Albert. For the general run of bush trees, to be planted from 15ft. to 20ft. apart, according to soil conditions. Malling Type II is most suitable, except for the very prolific varieties just mentioned. This is a semi-dwarfing stock represented by Doucin, and has long been used by many nurserymen, often, I believe, under the name of English Paradise. It is regarded at East Malling as the stock most adaptable for the moderate-sized bush tree, and for semi-permanent "fillers" in commercial orchards. For strictly temporary "fillers," planted about 10ft. apart, and for cordons, the very dwarfing Malling Type IX is well worthy of attention. This stock is represented by Jaune de Metz Paradise. It gives the real dwarf tree, which will fruit in the second or third season after planting, even if of a strong growing variety and pruned hard. Very vigorous stocks, corresponding to those known

as "crab" or "free" stocks, and suitable for full standards (Malling Types XII, XIII, and XVI), have been selected, and are being raised for trial by nurserymen, but trees on these stocks are not available at the time of writing. Such stocks are badly wanted to take the place of the old seedling stocks with their well-known variation in vigor and habit. Stocks for plums, pears, and cherries are now being investigated. Unfortunately the task of propagating the new stocks, and working up a stock of trees grafted on them, is a slow business; so it is bound to be some years before trees on some of the East Malling stocks become really plentiful. This refers particularly to apples on *Jaune de Metz*, which is a weak-growing stock difficult to propagate.

Some of the stocks named have been used by nurserymen for years, but, until they were classified and standardised, growers could not be certain what they were getting. They might ask for bushes on *paradise*, but the *paradise* used by one nurseryman was a very different type from that used by another. If the grower put himself in the hands of a thoroughly reliable nurseryman he probably fared well, but in other cases he often found that his trees did not do what was expected of them. Perhaps dwarf trees were wanted for fairly close planting, or as "fillers," and they grew away and over-filled the available space long before they began to bear remunerative crops; or perhaps large trees were wanted, and they proved to be on such a dwarfing stock that they never filled the required space. As for seedling "free" stocks, these vary so much amongst themselves that it is impossible to obtain a uniform batch of trees on them, and the sooner they disappear the better. All the East Malling stocks can be raised vegetatively from stool beds, and therefore will not vary or depart from type. It is much to the credit of nurserymen that they have shown themselves so ready to adopt the new standards, and it only remains for growers to stimulate the demand by using them. It will still be necessary, however, for them to obtain trees only from thoroughly reliable sources, for stocks supposed to be of the various Malling types are being sent over here from the Continent, and some of these are hopelessly mixed. Trees should be obtained from well-known nurserymen who raise their stocks from their own stool beds.

Growers will ultimately secure a further indirect advantage from the classification of stocks. Trees worked on them are now being used at research stations in this and other countries in experiments on manuring, pruning, etc. Uniform material is obviously essential in such work, and the absence of it in the past has no doubt been one of the chief reasons for the negative and conflicting results

obtained in many cases. I understand that some of the American stations are making a fresh start in manurial trials with trees on the East Malling stocks.

HORSE CULTIVATION.

Until recent years it was the almost universal custom to have fruit plantations forked over in winter, and kept clean during the growing season by horse cultivation and a great deal of hand hoeing. Some overcrowded orchards of bush trees can be cultivated only by hand work. The scarcity of labour during the war, and its high cost since, have stimulated growers to find cheaper means of cultivation. In order to reduce to a minimum the amount of winter forking, which was done cheaply by piece-work in the old days, ploughing began to be done, as far as possible, between the rows of trees. In order to facilitate work under the branches, Mr. W. P. Seabrook and Mr. J. B. Udall jointly introduced a special form of plough, which has since been imitated by several makers. The feature of these fruit farm or plantation ploughs is that the head and handles are adjustable, and can be off-set to enable the plough to work under low-hanging branches whilst the horse and man walk clear of the trees. The horses are attached by a single trace chain to a staple on the beam, and not as usual to the head, which in this case serves merely as a guide and support to the trace chain. The breast is designed to turn a wide, shallow furrow-slice, as deep ploughing is very undesirable. A disc coulter fitted in place of the ordinary knife coulter is a help in dealing with turf or thick weeds.

With one of these ploughs it is an easy matter to work quite close up to the stems of the trees, once the ploughman's prejudice against anything new has been overcome. There are several ways in which the ploughing can be done. The original idea was to plough up to the stems of the trees in autumn and again away from them in spring to restore the level of the land. I do not like this plan, as it means double work and brings to the surface again any manure and weeds buried at the first ploughing. It is better to plough towards the trees one winter, and away from them the next. In the former case a narrow strip on which the trees actually stand should be forked over first. In the case of ploughing away from the trees, this strip can be forked over afterwards. By thus alternating the direction of ploughing, and with the further help of surface cultivation in summer, the land is kept fairly level. If ploughing is done as shallow as possible (3 or 4 ins. deep), I do not think it does any more harm to roots than forking. Either

operation, however, I consider to be nothing better than a necessary evil, which must be endured only when the land becomes too weedy to be dealt with by surface cultivation, or when there is bulky manure to be buried. In a season when a dry autumn favours cultivation, ploughing can often be omitted. It must be admitted, however, that in countries where cover crops are a regular feature in orchard management, ploughing has to be done annually, and no objection to the practice seems to be raised.

In order to reduce hoeing to a minimum during spring and summer, cultivators and harrows to work under the branches have been introduced. Probably the most widely used and successful is a spring-tined harrow fitted with a disc rudder. This rudder attachment, which can be fitted to any spring-tined cultivator or harrow, is very successful in keeping the tool very close up to the stems of the trees, whilst the horses and man walk clear of the branches; and the harrows are so low that work can be done even under the low branches of old-fashioned bush trees with hardly any clear stem.

Another implement designed for use in orchards is the Garrett's cultivator with adjustable head and handles, which can be off-set in exactly the same manner as in the case of the plantation plough already described. This cultivator is low in build, and has rigid tines, to which points of various types can be fitted. I do not know to what extent this implement has been taken up by growers, but I have one which does good work. the only difficulty in its use being the innate prejudice of a horseman with old-fashioned ideas. It seems to be almost hopeless to get any new implement adopted unless the grower himself is capable of demonstrating its possibilities the first time it is taken out.

MOTOR CULTIVATION.

The use of tractors and motor cultivators has been taken up by fruit growers to a very considerable extent. The superiority of motor over horse traction amongst fruit trees will hardly be denied by any one who has tried or seen both. Apart from the speed and efficiency of the work done, there is very much less risk of damage to the branches with a tractor of low build than with a horse, the harness of which seems to be specially designed to catch the trees at every possible opportunity. The tractor most often seen on fruit farms is undoubtedly the Cletrac. This is a small tractor of the "caterpillar" or track-laying type, weighing only about 17 cwt. Its pressure is more evenly distributed over the ground than in the case of a tractor of wheeled type, and it

can be turned in its own length, an essential feature where headland space is limited. It is capable of drawing a two-furrow tractor plough on most soils, and any kind of cultivators and harrows. It a careful selection of implements be made, very little ground need be left to be cultivated by hand.

Whilst the Cletrac tractor is probably the best motor substitute for horses amongst fruit trees, there are fruit farms where the form of tree or the method of planting would not give space for a tractor even of this low and handy build with the driver seated on the machine. In such plantations, and wherever a substitute for hand rather than horse work is required, a Simar rotary cultivator is capable of doing excellent work. In this case, as the machine is only about 3ft. high, and the driver walks behind, with the steering arm off-set if required, cultivation can be done very close up to the stems of the trees if they are not less than 3ft. high. It must be understood that the Simar is not a tractor used for hauling different implements, but is a self contained motor cultivator, the tillage being done by a rotating miller fitted with hooked tines. As the action of the miller exerts a forward propelling force, and so relieves the travelling wheels of part of their haulage duty, the machine can be made of light weight, so that it does not sink into the ground or pan the soil. When the soil is reasonably dry this cultivator produces a fine seed bed in one operation, and could hardly be surpassed for giving a dust mulch during a dry summer to protect trees and bushes from drought. I have one of the earliest patterns of this machine, and it has given me good service. The latest model, No. 10, is being used on a good many fruit farms, and almost invariably with complete satisfaction. Of the few criticisms I have heard, the only one I can substantiate is that, whilst ordinary weeds are thrown out on the surface and killed, a creeping plant like bindweed (*Convolvulus arvensis*) is not effectively dealt with, but rather broken up into small pieces, many of which take root again.

PIGS IN ORCHARDS.

It is only natural that the open-air system of pig keeping, which has become so popular in recent years, should have made an early appeal to fruit growers. Some of them have solved both their cultivation and manurial problems by running pigs in their orchards. Two systems are to be seen, one of which aims at keeping the ground actually cultivated by pigs, and the other in which the pigs are used merely as grazers. The former plan came into vogue as a means of reclaiming orchards which had got into a foul state through

enforced neglect of cultivation during the war. It was found that if young pigs were run at the rate of about 20 on a half-acre strip, and encouraged to root by throwing beans or other suitable grain amongst the herbage, they would soon turn over the whole of the ground and destroy all weeds and grass, so long as the soil was moist. Having cleared one pen they could be moved on to fresh ground until the whole plantation was cleared. Provided that the pigs are constantly supplied with water, and are not kept amongst the trees after they are six months old, they very rarely do any harm to the stems. The spraying of the trees, even with such a poisonous material as arsenate of lead, does not appear to affect the pigs. For some reason or other, the surface is broken up most evenly if the animals are penned on long, narrow strips. I have seen cases in which the plan has answered well, the land being evenly cultivated, but in some other instances it has not given satisfaction, the pigs making deep holes in certain spots and neglecting the rest of the ground. Possibly the nature of the soil and the strain of pigs have an influence, or there may have been some error of management.

The other system of keeping pigs, in which the orchard is grassed down, and the pigs are expected merely to keep the herbage grazed off, is now much more commonly seen, and is probably more universally successful. One prominent grower, who wins prizes every year at the Imperial Fruit Show, says that he never spends a penny on cultivation after his trees are five years old, and hardly anything on fertilisers. Others go so far as to say that this system is the only profitable method of fruit growing.

As the pigs are not required to cultivate the ground, but merely to graze, they are not run so thickly as in the former system. Often they are given the free run of a whole plantation. The most attractive example of pig-keeping that has come under my notice, however, is at Brienton Manor Fruit Farm, Hereford, where Mr. George Marshall has grassed down some orchards of big old apples and plums, and divided them into pens in which some 300 to 400 Middle White pigs are housed and run. Before this was done the cultivation of these orchards had become a difficult problem. As about 100 tons of feeding stuffs are bought annually, it is not surprising that the trees are improving under the treatment. But the most striking feature is that the grasses and clovers are grazed down evenly, and that, although none of the pigs are rung, in no case do they appear to have broken the surface of the ground or attempted to root. This fact is attributed to their being supplied regularly with a proprietary mixture of minerals. Whether this

is the whole secret may be open to doubt. Probably some strains of pigs are more given to rooting than others, and in some soils there may be roots of weeds of which they are particularly fond and are certain to dig for.

POULTRY AMONGST FRUIT TREES.

A good many growers are running poultry instead of pigs in their fruit plantations. From the poultry-keeper's point of view it is obviously an ideal plan, as the trees provide shelter and partial shade, and there is ample natural food in the way of insect life and greenstuff. It is also claimed that the trees benefit greatly from the manure, that the birds devour so many insect pests that much less spraying is required, and that grass is kept down. Some enthusiasts have even gone so far as to say that poultry deal so effectually with insect pests that spraying can be given up altogether, and that the manure renders the trees so robust that they are largely resistant to fungus diseases! Although no one will deny that poultry destroy countless insects, and must do a great deal of good in an orchard, I think we may fairly attribute such wholesale statements to the enthusiasm of poultry-keepers rather than of fruit-growers. No doubt the birds catch many of the wingless female winter moths, and their larvæ and pupæ; but there are caterpillars of other species which do not spend any part of their lives in the ground. Then there are the various aphides and the apple sucker which never come within reach of poultry; and it has been found by experiment that the birds actually refuse apple blossom weevils when they are thrown to them. However, if poultry do not enable us to scrap our spraying machines, they are still very useful for keeping down grass, supplying manure, and for the additional return they bring.

It is claimed that 200 hens to the acre will cultivate the land, and that half that number will practically keep down grass and weeds. It has been found that the birds work the ground best if they are housed in small flocks, each house being placed in the centre of a pen. On one fruit farm five pens go to the acre, and each contains 24 hens. On another there are fifteen pens to the acre, with ten hens in each. Fowls of light breeds work the ground most; but they are the most difficult to confine, and are given to getting up into the trees and stripping them of fruit. Heavier breeds are therefore preferred, good results having been obtained with Sussex, White Wyandottes, and Rhode Island Reds. Such birds may be confined with wire netting 5ft. high. Indian Runner ducks, which are excellent layers, do splendid work amongst fruit

trees, as I know from experience, being extremely busy after insects, and keeping the grass down well, whilst they are easily kept within bounds with quite low wire netting. They are, however, open to the serious objection that they are easily upset and put off laying by the least disturbance, such as can hardly be avoided on a fruit farm.

PRUNING.

There is little that is new to record in the practice of pruning, but this does not mean that there is not a great deal yet to be learned about it. Growers continue to adopt such different methods that there is some justification for the opinion sometimes expressed by visitors from overseas that we really have no system at all. At one end of the scale we have growers who shorten leaders and spur laterals hard every winter, making each branch practically into a single cordon; and at the other extreme we have those who believe in nothing further than mere thinning out and the removal of dead wood once the foundation of the tree has been laid by hard pruning for two or three years after planting. It is probably true that the wisest method lies somewhere between these two extremes, and signs are not wanting that an increasing number of growers are adopting a light or moderate system of pruning. This movement can doubtless be traced to the influence of the well-known pruning experiments which have now been in progress for about ten years at the East Malling Research Station. These experiments have not yet reached their full and final results, but they have yielded a great deal of very valuable information which would well repay all growers for careful study. Most of those who have followed the results have probably come to the conclusion that the best treatment for permanent trees that are being brought into bearing (of most varieties, if not all), is light tipping of the leading shoots and long spurring of any laterals not required for the extension of the tree. The degree of leader-tipping will depend upon the vigour of the variety and the length of any particular season's growth, weak shoots being treated more severely than stout ones.

The long spurring of laterals means shortening them to three prominent buds in the first case, until an actual fruit bud is formed. when the spur may be shortened to that bud, though not before it is reasonably certain that it is a bud that will actually bloom. In the case of trees that are intended to be merely "fillers," which are therefore to be brought into bearing as early as possible for a brief career of fruitfulness, pruning should probably be reduced to mere thinning out to keep the centre more or less open, once

the foundation of the tree has been laid by the usual hard pruning for a year or two after planting. These, at any rate, are my own conclusions from the experiment. They are not intended to express the views of those responsible, who would be the last people to dogmatise as to what should be done in conditions other than those ruling at East Malling. The chief lesson of the experiment, so far, seems to be that pruning of any kind delays blooming and bearing, and the more severe the pruning the longer the delay. On the other hand, no pruning at all, or mere regulation of growth to keep the centre of the tree open, brings the tree quickly into bearing, but after some time leads to pronounced alternate year bearing. It is therefore unsuitable for permanent trees (at any rate of most varieties) for which leader-tipping has the further advantage of giving larger fruit, and reducing somewhat the amount of canker, scab, and apple mildew. The foregoing remarks all refer to apples, but the same principles probably apply to pears and plums also. In the case of the latter, however, many growers now reduce pruning to a minimum, once the tree has been formed, to avoid undue risk of introducing silver-leaf disease.

Owing to increasing trouble from brown rot, apple mildew, and silver-leaf, the last of which is beginning to attack apples as well as plums, the most progressive growers now attach great importance to the removal and destruction by burning of dead and diseased wood and the dressing of all large wounds made during pruning operations. The silver-leaf order, of course, enforces the destruction of dead wood from both plums and apples before July 15th every year; and, difficult as the undertaking proves in some seasons, this is a wise measure which has the support of the great majority of growers. The dressing of all large wounds made during this process, and during winter pruning, should be done promptly. So far nothing better than gas tar has been found for this purpose. If painted on the wound carefully, and kept off the surrounding bark as far as possible, no harm is done to the tree. Stockholm tar, which was at one time generally considered safer than gas tar, has been found to be much less effective as a protection against fungus diseases.

SPRAYING.

In orchard spraying nicotine and arsenate of lead continue to be the standard insecticides for sucking and leaf-biting insects respectively, whilst Bordeaux mixture and lime-sulphur are still the most popular fungicides for summer use, the latter being largely employed also as a winter or "delayed dormant" wash. An

important innovation, however, is the introduction of calcium caseinate as a "spray spreader," the idea having come to us from America. Calcium caseinate is a mixture of finely-ground casein and slaked lime. It is generally bought ready mixed, the proportions in some, at any rate, of the proprietary mixtures being 75 per cent. casein and 25 per cent. slaked lime. Such a mixture used at the rate of 2lbs. per 100 gallons of wash is considered to give maximum spreading results.

Calcium caseinate acts by reducing the surface tension of the liquid, thus giving it greater powers of wetting and spreading. Without the addition of the spreader a wash like lime-sulphur runs into drops on the surface of a leaf, and when these dry the chemicals are left in spots on the leaf, the intervening spaces being therefore unprotected against fungus spores. The addition of the spreader certainly results in a much more even coating of the leaf, and eventually something approaching an unbroken film of the dry chemical deposit. It is claimed that the efficiency of a fungicide is so much increased that it may be used very much weaker, thus avoiding risk of scorching foliage or russetting fruit, but I believe this has never been proved in actual orchard practice. However, there is no doubt that calcium caseinate is a cheap and valuable aid to efficiency when spraying with fungicides, such as lime-sulphur and Bordeaux mixture, and with arsenate of lead. Some growers use it instead of soap as a spreader for nicotine, but personally I have found it a poor substitute for soap in this case, doubtless because soap is itself a valuable insecticide for aphides and other sucking insects.

It has long been the desire of fruit-growers that a winter wash might be found which, when sprayed on the dormant trees, would kill insect eggs, specially those of aphides, and so save a lot of work and damage in spring and summer. At last such a wash seems to have been found in the form of certain tar distillate liquids. The first of these (now known as Carbokrimp) came from Holland, and was received by most growers, and certainly by me, with most decided scepticism. However, it was tried in various orchards in different parts of the country, and proved beyond all reasonable doubt that it did its work, the trees sprayed with it being free from aphides in the following season, and much freer from caterpillars as well.

The most convincing proof I have seen was in a Herefordshire plum orchard visited during the Federation of British Growers' tour of fruit plantations last year. It will be remembered that the previous year (1923) was a very bad one for leaf-curling plum

aphis and other pests. This particular orchard suffered so badly that the leaves were hardly kept on the trees by the usual methods of summer spraying. But four rows right through the plantation, which had been winter sprayed with the new wash, did keep their leaves. At the time of our visit in the season following those four rows could easily be picked out because of their healthy appearance and normal growth, whilst they were the only rows bearing anything like a crop. The rest of the plantation, like so many others in 1923, had not sufficiently recovered from the gruelling received from pests in the previous year. Several other demonstrations of the value of the new wash were seen during the tour.

A number of tar distillate washes of a similar nature have now been placed on the market by English makers. There is no reason why some of these should not be quite as good as the original brand, but caution suggests that they should be tried on a moderate scale at first. The treatment is so drastic that spraying must be done whilst the trees are quite dormant, preferably in December or January. It is also expensive, but this does not matter if it reduces the amount of spraying to be done in spring and summer. There may, however, be some danger in relying too much on winter spraying. There are certain insects, notably capsid bugs, which are kept under partial control by the regular use of nicotine washes in spring, and these would probably increase if nicotine spraying were abandoned.

Egg-killing winter washes have been investigated at the Long Ashton Research Station, and the important discovery made that lime-sulphur with 0.2 per cent. calcium caseinate has a marked killing effect on the eggs of the permanent apple aphis when applied in either February or March, and even when the dilution of the lime-sulphur is as high as 1 in 30. If these results are confirmed on trees in the orchard, this combination of lime-sulphur with calcium caseinate might well become more popular than the tar product washes, because it is much cheaper, and also because it is a valuable fungicide into the bargain.

The practice of dry spraying or dusting is on the increase amongst fruit growers, mainly for the control of aphides, including woolly aphis or American blight. The cost per acre for material is much higher than in the case of liquid spraying, but this is counter-balanced by the reduction in labour involved. The method is attractive because it obviates the heavy work of water-carting. Its adoption would probably be more rapid if satisfactory hand machines for distributing the powders were available. Most of

those at present on the market are very poor machines, whereas the power distributors are very efficient. For the control of caterpillars and the prevention of fungus diseases dusting is so far much less effective than liquid spraying. As growers must have a liquid spraying plant for this work, and also for winter spraying, it seems unlikely that the dry method will ever supersede the other.

MANURING.

There is no branch of their business in which growers have less data to work upon than in the manuring of their plantations, because such experimental work as has been done has had conflicting and often entirely negative results. The majority of growers continue to rely upon winter dressings of farmyard manure or such organic substitutes as wool shoddy, ground hoof and horn, meat meal, fish meal, etc. From these organic materials they do get results; and they argue, not without reason, that, if the soil is kept supplied with slow-acting manures of this kind, there is always a supply of food materials available for the trees to draw upon when they require it. There is, however, a growing feeling that something more might be done to overcome the well recognised alternate year bearing habit of fruit trees by the use of quick-acting manures at some time during the growing season. The common practice of giving the trees a generous dressing of manure in the winter following a heavy crop is obviously useless as an aid to securing a crop in the following year, since the fruit buds on which such a crop depends must be formed at some time during the previous growing season. It would seem that the trees need assistance most whilst they are carrying a crop, and probably in the early stages of that crop, so that they may have available the extra food material necessary to enable them to form fruit buds for the following year. There is evidence that those growers who make a generous use of manures, and those who keep their grass orchards well manured by grazing stock or poultry, have the most fruit to sell in the "off" year when it is most valuable. It may be assumed, therefore, that regular bearing is largely a matter of nutrition and that the problem of overcoming alternate year bearing may be solved in time by some method of manuring, possibly in combination with special treatment in the way of pruning to regulate the amount of bloom formed in the "on" year.

The manurial experiments with trees in pots in progress at the Long Ashton Research Station are already affording valuable information as to the effect on the tree of depriving it of any one of the various food materials. A study of these results will assist

a grower to discover whether his trees are suffering for want of any particular food. As an instance, leaf scorch may be mentioned as a common indication of lack of potash.

GRADING AND PACKING.

There is no department of the industry in which greater progress has been made in recent years than in the grading and packing of the produce. The general level of the packing seen in the chief markets is still deplorably low, but there has certainly been a marked increase in the number of growers who grade and pack well. Every year more growers adopt the standard non-returnable box as a package for the best grades of apples, and non-returnable chip baskets and punnets for the best samples of soft fruits; and an increasing number of those who adhere to the usual salesman's returnable baskets are experiencing the manifest advantage of careful grading and the declaration of net weights. The need for better packing in order to meet increasing competition from imported produce has given impetus to the movement, which has received much encouragement also from the Imperial Fruit Shows of the last four years and the attention given to the subject by the Ministry of Agriculture and the Federation of British Growers. Not the least benefit from this movement lies in its reaction on cultural methods. The grower who undertakes to pack apples in boxes, for instance, soon finds that he must raise his standard of culture from beginning to end, if he is to secure a fair proportion of fruit good enough for the purpose.

Some growers consider that packing and marketing should be no part of the growers' business, but that this work should be done at co-operative packing stations. The grower would then be able to devote all his time and energy to the cultivation of his crops. The packing stations could employ skilled labour and up-to-date appliances, and purchase all packing materials in large quantities at a low rate. Moreover, they would be in a position to place graded produce on the market in bulk, or to fulfil orders for large supplies of a certain grade. Last, but not least, they would be able to keep low-grade fruit off the best markets by sending it in bulk to jam factories or to recognised markets for rough produce. Last year the Ministry of Agriculture established a temporary packing station at Cottenham, Cambs., in order to afford to growers a demonstration of the possibilities of co-operative grading, packing, and marketing. At the time of writing this interesting experiment has not been in progress long enough to make it possible to say

whether the idea will be developed in other parts of the country, but it has been watched with great interest by growers in all districts.

PROPAGANDA.

Although propaganda can hardly be considered a branch of fruit culture, an article on progress in the industry would not be complete without brief mention of a scheme which is capable of very important results. I refer to the scheme for advertising fruit and vegetables introduced by the National Federation of Fruit and Potato Trades Associations. After two or three years of preliminary organisation this plan was at last put into full operation in 1924. It aims at advertising in the Press and by means of posters the principal fruits and vegetables as they come in season, and thus stimulating the demand amongst consumers. The necessary funds are raised by means of a joint levy from grower and salesman, the former paying 1d. and the latter $\frac{1}{4}$ d. in the pound sterling of gross return received for every consignment sold. The crop of home-grown fruit was so light last season that it would be difficult to trace any effect of the advertising on prices, but there is no doubt that the interest of the public was aroused and the demand increased. In any case, as business men know, the full effect of advertising does not show until the campaign has been in progress for two or three years. There is not the slightest doubt that the consumption of fruit and vegetables per head of the population, which is ridiculously low in this country, as compared with other civilised countries, is capable of great increase under the influence of persistent advertising.

IV.—THE BASKET WILLOW CROP AS A MEANS OF UTILISING WET LAND.

By Henry P. Hutchinson.

Large tracts of low-lying land in the coastal, estuarine and river valley regions of this country yield produce of little or no value. Such land, for the greater part of the year, is too wet to admit of being grazed by cattle and the crop of hay which might be obtained from it is coarse in character, inferior in feeding value, and frequently hazardous and costly to secure. Land near flood level is often particularly suited to the growing of the basket willow which is almost alone amongst the economic crops of this country in being able to thrive at the maximum water limits of cultivation. The

willow plant possesses adaptability to the water conditions of soils through a wide range. It will produce good crops when grown on land situated above flood level and the rods from high land willows are noted for their excellent quality, but considered from the point of view of a national economic system of cropping, its proper place is as a low land crop.

It is a mistake often made to believe that willows will succeed in soil situations that are permanently waterlogged, such as bogs. No variety of willow will succeed under prolonged stagnant conditions of soil water, but provided free drainage exists from the land to the supplying water-course, so that aeration of the soil becomes possible with the subsidence of the water to the normal level, the frequency and depth of flooding which the crop may receive, has no harmful effect so far as rod development is concerned.

General details in connection with the cultivation of the Willow Crop are contained in the Ministry of Agriculture's Pamphlet—"The Cultivation of Osiers and Willows," but as a rule such matters as fencing, draining, methods of preparation of the land, suitable varieties to plant, methods of planting, etc., are particular in cases where new land is to be planted, and can only be advised upon after inspection.

It is of more value to a man used to the working of land to tell him the objects to be achieved in preparing for, and in managing a crop, than to instruct him in the details involved in the several operations, because he knows from experience the implements which will serve the purpose, and how they should be used to give the best results. Further with the object in sight, he is able to estimate fairly approximately the costs involved and the length of time which a completion of the work would take.

With these facts in mind the stages in the conversion of grass land to willow beds may be considered in the following order.

THE LAND.

Tenancy.

It is usual for land to be let on lease for willow growing and stipulations are made under lease covenants, safeguarding the interests of both landlord and tenant. Considerable initial expense is incurred in planting new land, and where a tenant proposes to plant a portion of his farm, it is necessary, in case a separate lease covenant is not made, for him, in order to be eligible for compensation on his leaving the holding, to obtain the written consent of his landlord to the scheme as an improvement.

Soil.

A heavy rich loam soil resting on clay is the type of soil best suited for the growing of basket willows, as the crops grown on such soil are heavy in yield, the rods are of good quality, and the life duration of the heads may be expected to extend even beyond twenty-five years. Yield, quality, and length of life diminish as the proportion of sand or peat in the soil increases. On peat soils the plants may not continue to be productive for more than five or six years, and the rods are always of inferior quality, being brittle and of an unsatisfactory colour when peeled. From these facts it will be realised that the value of any land for the willow crop will largely determine the amount of capital that could profitably be spent in preparing and planting it.

Accessibility.

A right of way to the land is necessary and the condition of the road should be such as would enable the crop, which may amount to ten tons per acre per year to be carried off during the winter months. In some cases, where land is accessible by water, it may be most convenient to remove the crop by boat or barge.

Fencing.

The tops and leaves of basket willows are relished by all classes of farm stock, and serious damage may be done to the crop when cattle or sheep gain entry. Before planting, therefore, existing fences should be put in good order, and substantial new ones put down where required.

Drainage.

Surplus water should be removed by means of open drains, dykes or grips, and the number, width, depth and directions of these drains should be chiefly determined by the amounts of water to be removed and by the fall obtainable to the normal level of water in the supplying stream. The drain directions are generally with the natural fall of the land surface, but a compromise is frequently necessary so that undue interference with ploughing and cultivation operations at later stages may be avoided. Draining 'on the flat,' i.e., without giving fall, is sometimes the best plan to adopt. In this case the land water rises and falls with the variations of level of the water in the watercourse with which it is continuous. Covered pipe drains can only be constructed advantageously where

access for implements at gateways, or from one land to another, may be required. If the land be ploughed in the direction of drainage, it is often possible to convert the open furrows into drainage channels.

Preparation.

Willows will grow on the banks of streams, pond sides and wet borders, if cuttings are inserted to distances of one or two feet in the soil when it is wet enough. Under such circumstances no preparation of the ground need be given beyond the cutting away of other plants whose overshadowing leaves and stems might deprive the young willow shoots of light and air. The plants, when established are useful in giving protection to banks and drinking pools, and sometimes in raising the soil level by arresting flood depositions. The rods when cut are of value on the farm as fencing material, thatching sticks, as tie-rods for market garden produce, etc., but they possess little value for basket making purposes.

Basket willows will not thrive in the presence of a dense undergrowth of grasses and weeds, especially during the first two or three years after planting. It is, therefore, an essential operation at the outset to treat the land in such a way as will reduce the growth of weeds to a minimum. Formerly it was possible for growers to double dig their grounds, labour being plentiful, and wages low. There is no doubt that this method is superior to all others in that it secures a thorough burying of the turf, a good depth of loose mould, the probability of an effective control of weeds for some years without great expense, and heavy yields. But under present conditions even single spit digging is too expensive and is carried out only at corners and at other places which could not be ploughed.

A reversion and burying of the sod is best secured by double ploughing. Ridges are set at suitable distances and the first plough which turns the sod is followed by a heavier one which, by working at the bottom of the furrow, lifts the under soil and deposits it on the turf. If this operation be properly done no growth from old turf will occur, and ten or twelve inches of loose soil will be formed which will be sufficient to take ten inches of a twelve inch set, affording soil aeration and freedom of movement of soil water for a good root system to develop. Although double ploughing is expensive at the time (six horses and three men, are often required), it has the advantages over single ploughing in reducing the costs of hoeing during the following years, as well as in increasing annual yields of rods. It is now a usual practice to single plough the land. As great a depth is taken as the draught will allow, and the slices should be well

turned and closed. As it is often difficult to bury the turf by this means, additional labour is generally required in cleaning during the following spring and summer.

On level tracts having natural drainage it would probably be the best plan to use a 'one way' plough if a suitable one could be obtained. By this means the level surface of the land would be retained. Double ploughing by the use of this sort of plough would be impracticable, but sufficient depth by single ploughing could probably be obtained if it were possible to attach a sub-soiling tine. It is advisable in open furrow ploughing to keep the ridges as low as possible. A low ridge is set by ploughing shallow, and the depth increased every bout until the fourth, when the maximum depth should have been reached. The objections to having three or four feet strips of shallow ploughed land are that extra labour might be incurred in keeping the land at these places clean, and there might be some difficulty in inserting the cuttings, but with the exercise of a little extra care in hoeing, the plants on the land tops at the end of two or three seasons are indistinguishable from the rest.

Many acres of basket willows have been planted on meadowland ploughed to a depth of from four to six inches only, and the sets inserted in the rows of the furrow slices. This method is the least costly of any, but the turf grows again, and the grass must be kept in check by the use of heavy hoes during the succeeding summers. At the end of three seasons, generally the land surface becomes overgrown with grass which must be cut away by hand from amongst the growing rods.

SETS.

Cuttings from nine to sixteen inches in length are taken from shoots one or two years old. In selecting material for sets the best results will be obtained by taking rods (a) free from canker and any other fungus disease, (b) from plants which are vigorous in growth. Young heads up to ten years old are best for this purpose. This view is based on the experience of commercial practice, and has been confirmed by scientific investigations on manurial problems carried out at Long Ashton, where it has been clearly demonstrated that sets taken from willow plants fully fed, have produced much greater root and shoot growth than in the cases of corresponding sets taken from plants that have been deprived of one or other of the essential constituents of plant food. Thin rods—undergrowth—should not be used as sets.

PLANTING.

The operation may be carried out at any time following the fall of leaf and before sap movements begin in the spring. Autumn

planting frequently has the advantage of better soil conditions for the work, and where a large area has to be planted, relieves pressure of work in the spring. But winter frosts may lift autumn planted cuttings which must be then pushed back before growth commences.

Willow sets root readily when planted at any time during spring or summer if a planting stick be used and the bark not disturbed in the operation, but no commercial advantage seems possible by adopting this practice.

SUITABLE VARIETIES.

Many mistakes have been made in planting varieties unsuited to the soil and to the market requirements. There are many commercial varieties of basket willows. These show wide differences in their growth behaviours in regard to variations in soils as well as in the degrees of suitability which they possess for the making of any of the different classes of basketry. Primarily a grower should grow those varieties which best suit his land in yield combined with quality. But he should also take into account the types of rod needed in the market which he wishes to supply, and the condition in which it would be most advantageous to him to dispose of his crop, *i.e.*, whether as Green, White, Buff or Brown. These are matters on which new growers should seek advice.

MANAGEMENT OF THE GROWING CROP.

A crop of rods may be cut annually from the year of planting. The number of years during which the heads will retain their productiveness largely depends upon the amount of cultivation attention which the crop receives. Weeds, on typical willow land grow luxuriantly, and if the bed be left to nature, grasses, rushes, brambles etc., will cause the heads to die in a few years. The essential point is to keep down weed growth in spring, so that the yearly shoots may have light and air to enable them to over-reach it. It is particularly necessary to keep the weeds in subjection during the first three years. Horse and hand hoes are used for the purpose.

An established bed of willows may be kept in a state of tillage during the whole of its existence by cultivation in the autumn and early spring months, or it may be allowed to become permanently grass-grown. The method adopted in any case largely depends upon the water conditions. Where a bed is workably dry in the late autumn and early spring months, horse and hand-hoeing may be practised as regular annual operations, but where the ground is too wet to admit of being worked at these times of the year, the grower cannot prevent the natural plants (which are mostly grasses)

from establishing themselves. Their growth may be kept down by grazing with cattle for two or three weeks before spring growth of the willows begins, and by hand-cutting once or twice during the summer.

The yields are much heavier from land kept in a state of tillage than from grass-grown beds, and the heads last longer, but whether the practice is financially advisable or not in any particular case, largely depends upon the excess of the returns over the extra costs involved, which is largely determined by the natural degree of wetness of the ground. If the crop be allowed to remain uncut for two or three years, the dense overgrowth of willow tops has a smothering effect on weeds, and beds may often be cleaned by this means, especially when fully planted.

CUTTING AND PREPARATION FOR MARKET.

Most crops are cut annually, and if allowed to remain on the heads for a longer period than four years the 'sticks'—the term used for 'rods' of more than one year's growth—are generally too thick for the basketmaker's use, and become suitable for the crate-making industry. On land difficult of approach, field margins, banks, etc., it is frequently most convenient to cut the crop every second or third year. If cleanly grown, 'sticks' may return even greater profits than annual crops of rods would yield. Cutting should be done with a sharp knife, and the motion of the cutting stroke should be in an upward direction. The operation, if badly performed, results in wood fracture, and in unnecessarily long spurs being left on the heads whereby large irregularly shaped crowns are produced which become a hindrance to the passage of cultivation implements. The green crop may be sold by weight, by bolt of defined girth measurement, or by bulk, *i.e.*, "as it stands," cutting, tying, and delivery being matters of agreement between seller and buyer. Disputes may arise when dates of delivery, size of bolt, and times of weighing are not clearly stipulated when the bargains are made. It is, as a general rule, much more profitable for the grower to peel his crop before marketing than to sell it in any other way. In order to do so a supply of labour should be available in the neighbourhood.

The profits said to arise out of willow growing are sometimes disputed. Losses due to unfavourable weather conditions, insect and fungus attacks occur, but taking a series of years, few agricultural crops are so profitable and under such wet soil conditions as those under which the willow plant flourishes no other crop can

approach it in the returns which it is capable of giving. It is essential to success that the land should be suitable, the varieties correctly chosen, and the management carried out on right lines. As with other crops, management is frequently the main factor in deciding profit and loss, and intimate detailed knowledge should be possessed by the grower of the modifications of processes according to varying conditions, of the economic use of implements and tools, and above all, he should be able to direct his labour in every operation attendant on the crop in such a way as to ensure its most advantageous application.

The area of land in this country under basket willows is probably about 5,000 acres. Small beds exist in many stream valleys, but extensive beds are cultivated in the valleys of the Thames, the Wash rivers, Severn, Trent, Yorkshire Ouse, and Suffolk Stour, and at Mawdelsey in Lancashire. The chief district is the Athelney-Langport area of Somerset where about 3,000 acres are grown.

The whole of the crop of English grown willows is supplied to the basket-making industry of the country which, in addition, purchased from abroad—chiefly from Belgium, Holland and France—rods to the value of £54,261 in 1920 ; £23,809 in 1921 and £17,267 in 1922. No export trade is done. The value of imported basket ware (in which willow is chiefly used) was £557,351 for 1920 ; £385,925 for 1921 and £428,138 for 1922.

The figures show that scope exists for increasing the area of willows now grown, and if improved methods in cultivation and in preparing rods for use could be devised so that a reduction in the price of rods might be made to the basketmakers, development in both industries might be reasonably expected.

It is not generally realised that as a rural industry the cultivation and management of the basket willow crop creates a greater amount of wealth than is possible in the case of any other agricultural crop. The value of an established willow crop as peeled rods may be safely computed at between £25 and £35 per acre. This amount is distributed in the areas in which the crops are produced. The greater portion is paid as wages, and the rest distributed amongst landowner, farmer, and possibly merchant.

The effect of the development of basket willow growing in the Somerset area has been to improve very considerably the conditions of the workers. In 1870, Edward Jeboult in his book, "*The Valley of the Tone*," states, "Near the Isle of Athelney the country is divided into fields by numerous ditches and dykes, and to prevent travellers from riding into those that enclose the road, rows of trees are planted on each side. These are annually headed and supply

the cottages with wood. We could not help being struck with the extreme poverty of the people. Many of the cottages were mere huts, which would have been a disgrace to the days of King Alfred. Ague and rheumatism are said to be very common." At the present time, in contrast with these conditions of fifty years ago, the district is as healthy as most agricultural districts in the country, the dwelling houses are good, there is no unemployment, and the area has every appearance of rural prosperity.

V.—CONCERNING FUNGUS PESTS.

By S. Leonard Bastin.

Of all the pests with which the grower of crops has to contend there are none more formidable than those of fungus origin. The attacks of the harmful fungi are often so sudden, and the development so rapid, that a firm hold may be secured before it is realised that there is anything wrong at all. The mystery surrounding this onslaught on his crops will often make the grower feel strangely helpless. With the average insect pest he can see the cause of the trouble quite clearly and take steps to fight the attacking enemy. Where a fungus pest is concerned the plan of campaign is rarely so straightforward although the need for the taking of prompt measures is only too painfully evident. Every grower should acquaint himself with at least a general outline of the life and habits of the fungi. This knowledge will enable him to deal intelligently with such pests as may assail his crops. Then the carrying out of preventive or remedial measures will surely be more effective than is the case when practically nothing is known about the life cycle of the fungus pests which are causing the trouble.

WHAT ARE FUNGI ?

Right at the start it is well to understand a little about the nature of fungi. The fungi consist of a group of organisms belonging to the vegetable kingdom. Like the bacteria, fungi are different from all other forms of plant life in that they possess no green colouring matter or chlorophyll. On this account they are unable to obtain their carbon food supply from the air as is the case with ordinary plants. It is this which accounts for the fact that the fungus must live on something else ; the nutriment may be derived from dead plant or animal tissue in which case the fungus is known as a saprophyte, or, as often happens, the fungus finds its habitat on

living organisms and is a true parasite. Fungi vary greatly in size, some being very large, although the majority are small and even minute.

The typical fungus consists of two parts, namely a system of fine threads (*hyphae*), known as the mycelium and spores which correspond to the seeds of ordinary plants. It is well to understand the nature of the mycelium or vegetative part of the fungus. In the case of a large fungus, such as the mushroom, the mycelium consists of numerous white threads or "spawn" as they are collectively called. In the different kinds of fungi the mycelium varies a great deal from a few strands to a vast mass of branching hyphae. It is the business of the mycelium to absorb nutriment from the substance on which it is growing. This may be dead material, or a living host plant, in which latter case more or less definite injury will be caused to the tissues. In the case of the smaller fungi, the mycelium may be very minute, but it is similar in form and habit to that of the larger types. The mildews and moulds so common on leaf surfaces evidence a mycelial growth composed of tiny hyphae which can only be clearly seen with the aid of a magnifying glass. With many kinds of fungi the mycelium is embedded in the tissue of the host plant and it is only to be seen when the work of destruction is completed.

SPORES.

The reproductive bodies of the fungi are known as spores. These bodies which serve to propagate the particular species are always very minute although they are often produced in prodigious quantities. For example, it has been estimated that a single specimen of the common mushroom will be responsible for 1,800,000,000 spores and this is by no means a record. In fact the Giant Puffball, (*Calvatia gigantea*) when, of fair size, often produces a very much larger number of the tiny fruit bodies. Indeed, there is no doubt that certain of the fungi are amongst the most prolific organisms on our planet. Even the smaller kinds of fungi are usually very generous in the matter of spore bearing and it is no wonder that the tribe as a whole secure such a wide distribution. In the larger fungi the spores are borne on a cap-shaped structure such as is so familiar in the case of the mushroom. With the smaller kinds of fungi no such large outgrowth is produced and the spores are borne in a more simple manner. Always when the reproductive phase is reached an abundant dispersal of spores takes place whenever the weather is favourable. These are discharged like so much dust and on a dry breezy day they may be wafted to a considerable

distance. When one considers the scale on which the fungi produce their spores it is a wonder that fungus epidemics are not very much more common than is actually the case. Certainly for every spore which succeeds in developing into a mature plant there must be many millions that, from one cause or another, come to nothing.

THE DEVELOPING SPORE.

Whether the spore is to develop depends upon the chance that it happens to settle on a suitable location. As has been indicated, the fungus must live on something else, and, unless the spore has found its way to a suitable host plant, or to some substance on which the particular species can grow, nothing happens. It is interesting to note that fungi differ very much in their requirements. Certain kinds are so adaptable that they are able to flourish almost anywhere if moisture and vegetable matter of any kind are present. On the other hand many fungi have a much more limited range of habitat and must have leaf mould, dead wood, or rotten fruit as the case may be if they are to exist. Further, a large number of fungi evidence a marked tendency to feed on living organisms and appear true parasites. These last embrace the most serious of the fungus pests with which the grower has to contend. It should be noted that not all the parasitic fungi are of the extreme type. Varying degrees of parasitism are shown and, on this account, there is considerable diversity in the amount of damage that may be caused. Certain parasitic fungi grow with great freedom on dead material and, in the ordinary way, may be classed as saprophytes, yet under certain conditions, they will attack living tissue and cause a limited amount of damage. An instance of this is to be found in the case of Dry Rot (*Merulius Cocymanus*). This fungus not uncommonly flourishes in living timber where it will do a certain amount of damage. It is, however, far more destructive on the dead wood which is used in the construction of houses. A certain number of harmful fungi start life on a dead branch and then abandon their saprophytic habits and become definitely parasitic. Some of the most troublesome of the fungus pests that attack fruit trees behave in this manner. Instances of this particular method of attack are to be found in the cases of Brown Rot, Apple Canker and Silver Leaf. Finally, there are the exclusively parasitic forms of fungi. To be successful these plants must be able to alight upon and infect living tissue and failing this there is no development beyond a possible spore germination. Included amongst these advanced parasitic fungi are the rusts, the mildews, and the false rusts. The mode of attack in such cases is briefly on the

following lines. After alighting on a leaf the moisture provided by dew or a light shower of rain enables the spore to germinate. The germ tube of the spore enters the leaf either through the stemata (*breathing pores*) or by piercing its way through the epidermis or outer skin of the leaf. It should be noted that the true mildews have rather a different method of settling down on to the host plant. Here the actual fungus is superficial and all the nutriment is extracted from the leaf by means of special suckers which penetrate the epidermal cells.

MORE THAN ONE KIND OF SPORE.

Many of the most formidable fungus pests have extremely complicated life histories. These are not in all cases entirely understood at the present time, although in recent years numerous points of difficulty have been cleared up. It has been stated that the reproductive body of the fungus is a spore, but many species are notable on account of the fact that, at different stages in their life cycles, they produce two or even more kinds of spores. A good illustration of this is to be seen in the case of the mildew which so commonly attacks rose leaves in the summer. An examination with a lens shows that the mildew resembles a thin coating of wheat flour on the leaf. A further magnification would reveal the fact that this powder consists of colourless oblong bodies which are properly known as conidia or summer spores. The special feature of the conidia is that they are capable of germination the moment they mature. The production of the conidial form of spores continues daily throughout the growing season and, as myriads of these are sent out, it can be readily understood how the disease spreads not only from one plant to another in the same garden but also to more distant situations. Conidias are usually very short lived, usually only retaining the power of germination for a few days, after which they perish. The chief use of the conidia or summer spores is to enable the fungus to extend its area of distribution. Those abundant outbreak of fungus growths, which so often prove destructive to cultivated crops, are invariably due to the rapid development and extension of the conidial stage of the pest.

If the white patches of the mildew on the rose leaf are examined during the autumn it will be found that they have undergone a change. Tiny dots, smaller than the head of a small pin, may be seen scattered over the cotton-like mildew. These small black balls represent the winter fruit of the fungus. Their structure is very complicated and cannot be fully understood without the aid of a microscope. Briefly it may be stated that each little ball

contains several spores in its interior. These spores, unlike the conidia or summer spores, do not germinate at once but will require a period or rest before they will do so. Actually they will remain inactive until the coming of the spring. When the spring does come the balls rapidly decay and liberate the contained spores which are dispersed by the wind. These which are so fortunate as to alight on a rose leaf set up an infection which results in the development of a patch of mildew and, in course of time, the conidia or summer spores are developed once more. This continues throughout the warm season and, at the close, the winter fruits appear on the scene again. So the life cycle of the mildew is completed.

THE STORY OF THE CORN RUST.

It has been suggested that some kinds of fungi possess more than two forms of reproductive bodies. This is especially the case with certain fungi which have acquired the strange habit of spending one part of their life cycle on a certain host plant and the remaining portion on a distinct species. This peculiarity is perhaps most marked in the case of the fungi termed "rusts" such as the corn-rust (*Puccinia graminis*). The life story of the corn-rust is surely one of the most curious in the whole of the natural world. It is most convenient to start the explanation of the cycle of development with the winter fruit which is produced on the fading leaves and culms of wheat and some other grasses. These winter spores, as is usual with such bodies, require a period of rest before they can germinate, in fact they will not start active life until the following spring. On germination the winter spores ultimately give rise to very much smaller spores which are drifted about by the wind. These can only proceed to the next stage if they happen to alight on the young leaves of the common Barberry (*Berberis vulgaris*). If an infection is set up there eventually appears on the scene the development commonly known as "cluster-cups," curious cup-like structures which contain spores. In passing it is worth noting that it is not so long since the "cluster-cups" were considered to be quite a distinct species of fungus and it was not suspected that the growth was in any way connected with corn-rust. The cluster-cups are the first stage of the corn-rust produced in the spring of the year on the leaves of the Barberry. When the spores in the cups are ready for development they are dispersed by the wind and those that alight on the leaves or leaf sheaths of wheat or other suitable grasses will, in due course, give rise to the conidial or summer-fruit stage of the fungus. The pest then appears in the familiar orange streaks on the leaves and other parts of the wheat

plant. The summer spores are produced on a liberal scale and as these are freely carried about by the wind other wheat plants are soon infected. The production of the summer spores continues throughout the whole of the growing season of the wheat plant and, where the hosts are crowded together, as is the case in a field, the disease of corn-rust soon becomes epidemic. When the wheat begins to ripen the development of summer spores slackens and finally ceases. The same mycelium which produced them, now is responsible for the development of resting or winter spores. These remain attached to the straw or leaves until the following spring when they are dispersed and bring about the infection of Barberry leaves with the subsequent growth of the cluster-cups and a repetition of the cycle of development which has been described.

Such is the fullest development of the corn-rust, but, in certain conditions, one or other of the phases in the life cycle may be passed over. This will not at all interfere with the appearance of the remaining stages. The behaviour of corn rust in the Southern Hemisphere is an excellent case in point. Somehow the pest was introduced into Australia, where it causes even more trouble than it does in Europe. Yet it so happens that for some reason connected with the climate or the absence of a suitable host plant, the cluster-cup form of the fungus is entirely absent. The summer-form and the winter-form of spore are alone produced in Australia. Corn-rust, which has been introduced into sub-tropical or warm temperate regions, where the host plant is growing all the year round, will continuously produce summer spores and the winter-form or resting spore is quite unknown.

DEVELOPMENTS OF THE MYCELIUM.

It has been shown that by the production of resting spores at the end of the growing season fungi are able to bridge the winter months and hold themselves in readiness for the resumption of active life in the spring. In many of the larger fungi the mycelium is perennial in habit and may persist for some years until indeed all possible nutriment has been absorbed from the substance on which it is growing. This is plainly seen in the case of many fungi that attack growing trees. The special external structures that bear the spores will appear year after year from the same stump and these are outgrowths from the original mycelium. In some instances this mycelium assumes a hard cord-like nature in which form it is known as rhizomorph. Rhizomorphs are often phosphorescent and the glow commonly to be seen in rotting wood is due to the presence of

this development of mycelium. Rhizomorphs are particularly tenacious of life and, even if completely dried, will resume active growth when moisture is once more available. Another form of mycelium, which enables a fungus to carry on the race over periods when active growth is not possible, is to be seen in the peculiar nodules known as sclerotia. These vary considerably in size and at one time they were classed as a separate genus, but it is now known that the bodies occur in many groups of fungi. A dried sclerotium is hard and compact, consisting entirely of interwoven hyphæ or mycelia threads. The body is covered with thick brown or blackish cells. Sclerotia contain reserves of food materials to be utilised sooner or later by the fungus that is destined to arise from the body. The abundant production of sclerotia may be compared to the luxuriant growth without flowers or fruit of normally flowering plants which, under certain conditions, will take place. Such plants at a later date are able to produce flowers and fruits very freely owing to the large reserve of food material which the foliage has been able to store away. The whole question of these Sclerotia is one of immense importance to the grower of crops. By means of these bodies any fungus pests are not only able to hibernate during the winter but, during conditions unfavourable for active growth, the fungus is able to exist in these processes.

THE CLOVER STEM ROT.

An interesting case in point is that of the sclerotia associated with the pest known as Clover Stem Rot (*Sclerotinia trifoliorum*). As is well known Stem Rot attacks the clover plants in winter and spring causing a rotting of the leaves and shoots. In damp weather the disease spreads rapidly and in a short while may destroy the foliage of a whole field. The fungus perpetuates itself in the soil by means of resting bodies or sclerotia. These which are chiefly formed in the early part of the year and the spring are hard and black in colour and spherical or flattened in shape. The sclerotia occur chiefly around the collars of the plants and on the dead roots and may be found three or four inches below the surface of the soil. They also occur in and on the stems, in which position their development is easily traced. It will be seen that each develops as a dense white cushion-like growth which soon turns grey and finally becomes firm with a hard black coat. Inside the sclerotia are white and of a texture of cheese. It is most important to be able to recognise these bodies since they form one of the readiest methods of identifying the exact nature of the disease. When

buried in the soil the sclerotia are capable of retaining their vitality for a number of years. In any case they remain dormant during the summer after their production, but they may germinate with the rains and cooler weather of the late autumn and give rise to bodies producing spores. In order to germinate they have to be near the surface and, if buried deeply, the sclerotia stay in a dormant state. However, in the ordinary routine of farm cultivation the sclerotia are likely to be brought to the surface when under favourable conditions they will resume their activity.

BACTERIAL FUNGOID PESTS.

Most of the fungus pests which have been noticed up to the present will, at some stage of their development, be visible to the eye of the grower. There are numerous low forms of fungoid life, some of which approach to the bacteria themselves, which are parasitic on plants. In most of these cases no sign of the parasite can be discerned although the damage caused by the attack is only too evident. Potato Scab (*Actinomyces scabies*) is a very good case in point. Potato tubers are often rendered unsightly by brown patches on the skin. These have been attributed to various causes such as mechanical injury or irritation by some substance in the soil, but there is no doubt that, in a large number of cases, the scabs are due to the presence of a minute fungoid parasite. The organism which causes the scab is believed to be present in almost all garden soil. It is even thought that, in a normal way, it may play a useful part in the decomposition of organic matter. The scabs on the potatoes spread rapidly and the appearance of the tubers is rendered very unsightly so that there is a drop in their commercial value. Moreover, potatoes covered with scabs are prone to decay after storage. A bacterial potato disease which has a very wide distribution is known as Black Leg or Black Stem Rot (*Bacillus phytophthorus*). Affected plants first show signs of the trouble from the middle of June onwards. The plants have a generally stunted appearance and there is a tendency for the leaves to curl inwards. It is at the base of the stem that the disease is most in evidence. In a bad case the stem rots right through so that it can be easily pulled away. A transverse section of an affected stem will show that the vascular bundles have turned brown in colour owing to the activities of the bacteria. If these vascular bundles are examined under the microscope they are seen to be swarming with the bacteria. Plants that have been affected early in the season by Black Leg will often die before they have had a chance to start tuber formation. When the trouble has been

late in starting, new tubers may have been formed, but these will nearly always be attacked by the bacilli. The diseased tubers will be much discoloured and are often quite soft, especially at that part which is nearest to the stem. Each diseased potato will contain countless millions of the harmful bacteria and these may spread to other tubers even after storage of a crop. Even apparently healthy tubers which have come from plants attacked by Black Leg are never safe for use as seed or for storing away.

THE SLIME FUNGI.

Several troublesome potato diseases are due to the activities of organisms belonging to, or closely connected with, that singular group known as the Slime Fungi, (*Myxomycetes*). These represent a type of organism which has been placed on the borderland of the animal and vegetable kingdoms. In their vegetative state the Slime Fungi consist of a mass of naked protoplasm in which condition the organism moves about and is able to absorb solid matter in a manner quite unknown amongst plants. When the time for reproduction arrives the creature (if one may call it such) completely changes its character. It then converts itself into a collection of fruits in which spores are produced. In this latter phase the Slime Fungus has many characteristics which, in the ordinary way, are associated with plant life. The Corky Scab (*Spongospora subterranea*) of potatoes is caused by a tiny parasitic organism belonging to the Slime Fungi. The *Spongospora* is widely distributed in temperate regions all over the world, and not long since it was discovered in Peru, the original home of the potato. The first signs of Corky Scab in a tuber are to be seen in small rounded swellings. These contain the *Spongospora* organisms and, as the activities of the parasites increase, the skin surrounding the lumps become broken. Shortly afterwards the parasite is ready for reproduction and numerous tiny brown bodies known as spore-balls are developed. With a lens these appear to be so much brown dust, although each ball represents a number of spores clustered together. Naturally before the affected crop is lifted large numbers of the spore-balls will have been liberated into the soil. The manner in which the infection of tubers with Corky Scab comes about is interesting. It has been noted that, at a certain stage in the development of the organism, the spore-balls are sent out into the soil. It is not known how long these spore-balls remains dormant, although it is believed that nothing happens until the following spring. It is quite possible that the spore-balls may retain their vitality for a considerable time should the conditions for development be unfavourable. When the

right conditions do arise each separate spore in the agglomeration will split up into a number of very minute spores (*Zoospores*) which are extremely active. Prodigious numbers of these zoospores swarm away through the soil and, if there should be a potato crop in the ground, a big proportion of the bodies are certain to come up against the young growing tubers. These attacks will be responsible for the rounded lumps which have already been mentioned as the early stages of the Corky Scab disease. Another destructive potato disease known as Wart Disease or Black Scab is caused by a member of a low group of fungi (the *Chytridiaceae*), which in many respects resemble the Slime Fungi already mentioned. The particular disease under notice is caused by a tiny organism known as *Synchytrium endobioticum*. A diseased tuber is at once recognised by the curious tumours at one or more points. The trouble is not by any means confined to the tubers, for the warts are often found at the collar of the haulm either just above or below the level of the soil. Generally speaking it is the tubers which are most near to the surface that are most badly attacked. That the *Synchytrium* is a very low form of fungoid life is shown by the fact that in its early stages there is no trace of a mycelium. The parasite is simply a mass of living matter existing in the cells of the potato. During warm weather the pest is spread through the agency of spores which release active zoospore into the soil. For the winter season a special resting spore is developed. These resting spores are enclosed in a hard case and, when the tubers in which they have been evolved decay, they are loosed into the soil. Here they may remain as resting spores or in some other state for an indefinite time. How long vitality may be retained has not been definitely established, although there is good reason for believing that the spores may be dormant for at least five years and then be ready to start an active career. When the germination of the spores does take place they give rise to hosts of zoospores which are able to infect fresh potato plants.

FUNGUS PESTS AND UNCULTIVATED PLANTS.

One important feature of the fight against fungus pests is the fact that these parasites may attack plants which are not being cultivated. Quite often the starting point of an epidemic may be that the parasite has secured a hold on some patch of weeds that may be growing by the side of the field. As has been indicated, corn rust is not only found in the wheat plant but quite often its host is some wild grass. Clover Stem Rot is also able to attack many kinds of leguminous plants with varying degrees of intensity.

Of recent years fruit growers have suffered very severely from the attacks of the disease known as Silver Leaf. Although there is still room for more research into the exact nature of this pest most authorities are agreed that the fungus known as *Stereum purpureum* is primarily responsible for the disease. Silver Leaf is particularly likely to attack such trees as plum, apple, apricot, cherry, peach and nectarine. It has also been noticed on trees and shrubs belonging to very diverse families, amongst which may be mentioned the horse chestnut, laburnum, Portugal laurel and the tree lupin. The Wart disease of the potato does not by any means confine its attention to this plant. It is well known that several plants allied to the potato are very prone to be attacked. These include the Woody Nightshade (*Solanum dulcamara*) and the Black Nightshade (*Solanum nigrum*). In fact it is always wise for the grower to keep a sharp look out for any signs of fungus pests on weeds and uncultivated plants generally. Most of our common weeds start active growth at an early date and, on this account, the fungus pests are able to reach an advanced stage of development by the time the cultivated crops are well under way. Then the attack is transferred from hedgerow to field where the parasites find an easier prey in the cultivated plants than they did in the more sturdy wildlings.

THE IMPORTANCE OF PREVENTIVE MEASURES.

In dealing with fungus pests one cannot over-estimate the importance of preventive measures. When once the pest has secured a firm hold it is often impossible to prevent a great amount of damage which, in certain cases, may well involve the complete loss of the crop. Right at the start one cannot exaggerate the importance of a good all round cultivation. A healthy stock, growing under favourable conditions, does not easily fall a victim to the deadly fungus pests. Another point which must be emphasised is the selection of disease-resistant varieties. In the case of all crops there is a wide selection of varieties available and every year sees addition to the list. In many instances some varieties have been proved to be immune from certain fungoid diseases even when the crops are actually exposed to the attacks. Where complete immunity has not been secured there are, usually, varieties which are better fitted to resist the fungus peril than those which experience has shown to be very susceptible. The selection of the right variety, after due consideration has been given to such questions as soil and climate, may well mean the difference between success and failure. It will sometimes be found that when good growth and resistance to particular fungoid disease has been secured the crop suddenly

falls a victim to another pest. So that even after taking all reasonable precautions the growers must be on the look out for danger signals. It is only by early and prompt treatment that one can prevent the newcomer from becoming firmly established. One very disconcerting feature about many fungus pests is the way they have of suddenly breaking out in a most virulent form after years of comparative inactivity. A very good illustration of this is to be found in case of the well-known Potato Disease (*Phytophthora infestans*). Prior to 1845, although this pest was known, it had never proved a serious difficulty. Yet, in August of that year, the Potato disease appeared in most European countries and also throughout the greater part of the North American continent. In Ireland the potato crops were so badly blighted that acute distress followed the visitation. In fact so alarming was the outlook that more than one serious observer considered that the cultivation of potatoes might be rendered impossible as far as many countries were concerned. Happily these apprehensions have not been realised, but there is always a danger that the pest might appear in severe epidemic form again at any time.

SOME TYPICAL FUNGUS PESTS.

To illustrate the methods which the grower should adopt when dealing with a fungus pest one cannot do better than describe a few actual instances. An important wheat disease, known as Bunt or Stinking Smut, is responsible for a considerable loss each year in this country. The trouble is caused by a fungus named *Tilletia tritici*. One peculiar feature of the disease is that the ear, even when badly attacked, presents an almost normal appearance. When the grains are broken they are found to contain a mass of black powder which is really formed of fungus spores. Those who are familiar with the pest will note that in an affected plant the ears are of a deep blue green colour and that the chaffy scales spread out rather more than in a healthy plant. The spores of the fungus are very minute and it is of course these which, by adhering to the seed grain, or falling to the ground, bring about the infection of fresh plants. Bunt is freely spread during threshing, as at such times some of the grains will burst and in this manner the spores are liberated in clouds. Winnowing, although it will remove bunted grains, and broken fragments, does not free the grains from spores. The fact that the grains may not be very badly infected is no excuse for failure to take action; always, if the disease is present, a considerable proportion of the grains will give rise to infected plants. It is important to remember that Bunt may be spread by means of the

thresher through which grains contaminated by spores have been passed. Sacks in which bunted grains have been stored are also a source of danger and the same is true of barn floors on which diseased wheat has been resting.

HOW BUNT INFECTS WHEAT.

Briefly, the way in which Bunt attacks wheat is on the following lines. The wheat plant is infected by the fungus whilst it is quite young. The spores which have been introduced with the seed germinate and soon other spores are produced and these spread the disease. Always infection takes place when the wheat is in the seedling stage, usually before the shoot is more than half an inch long. On entering the plant the germ tube of the fungus bores its way into the young shoots. Then follows the development of the mycelium and this makes its way to the top of the plant. All along the fungus remains at the apex of the plant. On the formation of the ear the pest extends into the grains and the fungus exists upon the nutriment which the plant passes up for the development of the grains. In this way the tissue is destroyed and, when the reproductive time arrives, there follows the development of a solid mass of black spores.

CONTROL OF BUNT.

The only certain way of making sure that wheat will be free from Bunt is to treat all seed corn with a fungicide whether it appears to be infected or not. The method is commonly known as pickling and of many substances which have been tried none has yielded such good results as formaldehyde. This chemical, which is commonly sold in the form of formalin, is easy and safe to apply. Formalin (a 40 per cent solution of formaldehyde) should be employed at the rate of one pint to forty gallons of water or half a fluid ounce to each gallon. The solution is freely sprinkled over the seed grain, the heap then being well turned about to make certain that the grains are well moistened. The solution must not be allowed to form pools under the heap in which the grains might get unduly soaked. After shovelling cover the heap with sacking which has been moistened with formalin and then leave the whole for about four hours. Finally spread out the grains to dry and sow as soon as possible. Care should be taken to see that the grains are not re-infected by putting in sacks or spreading on a floor where the spores of the fungus might be present. Copper sulphate solution in the proportion of two and a half pounds to ten gallons of water may also be used with good results. On no account should a

stronger solution of copper sulphate be employed or serious damage to the grain may result.

FINGER-AND-TOE DISEASE, OR CLUBROOT.

The formidable disease of Clubroot or "Finger-and-Toe" is only too well known to those who grow turnips and cabbages. The trouble is due to the attacks of a fungus of simple structure known as *Plasmodiophora brassicæ*. This species is allied to the Slime Fungi of which mention has been made on another page and in its vegetative stage it consists of minute masses of naked protoplasm. These masses tend to unite when they meet and thus they increase in size forming what are known as plasmodia. After a time the plasmodia become covered with a firm coat and breaks up into myriads of small round cells or spores each enclosed in a cell wall. These spores remain for a time unchanged. When the circumstances are favourable the spores burst, throw off the cell wall, and appear as very minute plasmodia which go through the same development as before. Most of the true Slime Fungi live on decaying organic matter but the fungus which causes Clubroot is an exception. The minute plasmodia penetrate the living tissue of the host plant and are truly parasitic.

THE HARM CAUSED BY CLUBROOT.

The roots of a plant attacked by Clubroot vary considerably according to the stage of the attack. The branch roots very often bear swellings much exceeding the proper thickness of these roots. The swellings are usually roundish and at first they are often smooth, but later on they may become extremely rough. The main root is also often badly injured as shown by its large size and roughly fingered appearance. In the autumn and, as the winter advances, the diseased parts become more and more pulpy and often other fungi appear. Finally, only the woody parts of the root remain all the cellular tissues having dried up so that they resemble coarse dust. A microscopic examination of a diseased root will at times show certain areas of the tissue which are hardly altered at all. Against these are larger regions which are occupied by the parasite and these present a curiously mottled appearance. Newly attacked roots contain a slimy substance in which are numerous cavities filled with cell sap or air. If examined at a later stage the cells of the root are found to be filled with the minute transparent spore of the fungus. These remain uninjured during the coldest winter weather and make up a large part of that dusty material which is present in decayed roots. The spores are carried about on the surface soil by wind and driven into the ground by rain. When the

weather becomes warmer with the return of the spring the spores germinate and the protoplasmic contents emerge and creep about in the damp soil largely by the help of a slender hair or cilium at one part. When these bodies come into contact with others they unite completely and in this way form larger plasmodia. If the plasmodia meet with the roots of cabbage, turnip, charlock or wild mustard, they make their way into them and speedily set up an infection.

Clubroot has spread amazingly in recent times and so much has this been the case that, in some districts, it is hardly profitable to grow turnips at all. One point which is quite clear is that if cabbages or turnips are grown in a field where a diseased crop has been allowed to rot the pest is certain to re-appear in the following year. Even after a year there is a considerable risk although the tendency for a severe outbreak lessens with the passage of time. It is a most dangerous practise to dig a crop attacked by Clubroot into the ground although, on account of the fact that there is nothing of value to remove, this is often done.

FIGHTING THE CLUBROOT PERIL.

Unhappily, as is the case with so many fungus pests, no really practicable means of curing Clubroot is available. Preventive measures can alone be taken and to be effective these must be carried out with great thoroughness. All diseased roots should be collected at as early a stage as possible and destroyed by burning. Ground which has been infected should not have turnips or cabbages grown on it for quite two years to enable the spores of the pest to die out. Another important means of preventing Finger-and-Toe disease is the systematic destruction of all charlock and wild mustard in the neighbourhood. Cabbage crops should always be critically observed for sign of Clubroot. Now and again the disease does not have a very disastrous effect on cabbages; a turnip crop which follows may be so badly affected as to be of no value at all. There is reason for believing that the use of superphosphates or soluble phosphates as fertilisers tends to stimulate the activities of the pest. A more suitable artificial manure for turnips, at any rate, is found in ground or steamed bone flour.

THE STALK DISEASE OF POTATOES.

Apart from the commonly called Potato Disease (*Phytophora infestans*), the Stalk Disease (*Sclerotinia sclerotiorum*) is the most serious of all the pests attacking this important crop. The fungus causing the trouble is closely related to the organisms associated with Clover Sickness. Like most of the worst Potato diseases the

Stalk Disease gives chief trouble in the damper parts of the country. Thus it is more common in the western counties than on the east side of England. In any locality, if the weather is damp and close, Stalk Disease is always likely to appear. As a rule it will not come on the scene until after Midsummer and the first sign will be that parts of the stems are covered with a dense white coating. This is the mycelia of the fungus and, in course of time, numerous rounded cushions appear. Eventually these become hard and black and they may be as large as a Pea. These bodies are the resting processes (*Sclerotia*) of the fungus and, towards the end of the summer, they fall off, to lie dormant in the soil until the following spring. Before this happens, the disease will have played havoc with the potato plant.

The tubers are not directly affected, but their growth and development are hampered to a very serious extent on account of the way in which the fungus attacks the stem. As the Stalk Disease progresses it destroys the tissues of the stem so that the whole thing collapses and falls to the ground and the foliage above the point of attack dies. To return to the sclerotia which will be lying in great numbers in the soil. With the return of warm weather these germinate and give rise to cup-shaped bodies borne on slender stalks. The processes rise just above the level of the ground and in the cup the spores are produced. The light spores are freely dispersed by the wind and such as alight on potato leaves stand a good chance of developing. The initial stages of development are made in the leaves but the fungus soon passes to the stem. Now and again the stem may be directly attacked, especially if the spores have settled in any position where there is water, such as for instance at the axils of the leaves. The Stalk Disease does not confine its attentions to potatoes but is also prone to attack a large number of garden plants such as tomato, artichoke, bean, marrow, cucumber, carrot and turnip.

FIGHTING THE STALK DISEASE.

Efforts to check Stalk Disease by spraying the foliage have not yielded good results. The treatment of affected soil apart from complete sterilisation by heat (only possible on a small scale in the garden) has up to the present proved to be of no avail. Where ground is known to be infected with *Sclerotinia* the only safe plan is to avoid cropping with potatoes for at least three years. When the disease has appeared every infected plant should be burned at the earliest possible moment. In localities where the Stalk Disease has proved a difficulty only immune varieties should be cultivated.

VI.—VOCATIONAL TRAINING IN AGRICULTURE.

By Gervaise Turnbull.

Vocational training is very much to the fore at present, but perpetual difficulties attend its path in relation to Agriculture.

Many have been the efforts made to devise suitable standards of instruction which shall embrace a sound theory of farming. It may be considered an elusive class-room subject, but its principles have been reduced to writing by more than one master of the craft, and sound progress will not be achieved by mere introductions to the cognate science, however interesting they be.

There would seem to be no adequate reason why the principles of the underlying practice should be less applicable to instruction than are those of other practical arts. The apprentice or craftsman who learns the theory of his calling at a polytechnic, and even the salesman are considered to be educating themselves on right lines, but the agriculturalist who does so is still often suspect, and opportunities offered are not always of the best. Is the subject at fault, or are the methods of imparting knowledge to blame?

Let us examine the effects in the practice of the farmer of this unfortunate tendency, and see how it effects tillage, which forms the mainstay of Agriculture.

First rate tillers of the soil are not common, and it is acknowledged that the work done to-day in this direction is often very inferior to that of our forefathers. In the absence of good practical instructors on the farm how far is this due to the neglect of this great subject at teaching centres, which is so common?

Short crops and poor crops are not always due to bad economic conditions, or to bad season, or to peculiarities of soil or climate. Tillage may be supposed to come naturally to the son of the soil, but in it there is a great deal to understand, and a good deal that might be profitably expounded in a lecture or in a rural school. There is no valid reason why the principles of agricultural practice should not be so taught, and, fundamentally practical subject though tillage is, there is much that is of scientific interest that can be woven around its teaching.

Physics are very much to the fore in education, and soil physics are taught to some extent, admirably lending themselves, as they do, to elucidate and explain the niceties of tillage. Quite a lot of soil science is, in fact, available now for students. But soil science is, at the same time, a complex and difficult study, of the kind which of itself tends to beget the studious rather than the practical

turn of mind, giving rise to a tendency to regard the farm more as a laboratory than a workshop.

Could not the hiatus between theory and practice, which must always exist, be modified if tillage as such were properly treated as a class-room subject? No sensible man would deny that it must be learned practically as well, but theory should underly all practice, or there would be no governing principles by which excellence in practice could be achieved in a ploughing match or hedging competition. If this applies in a craft of any sort, particularly should it do so in tillage.

Let those in doubt on this matter question so called practical men. There will be found great difference of opinion, as also of practice, as to tillage, and little in the way of standard in its underlying principles. Even the best seasons for ploughing for different crops are perhaps, unknown or disregarded, while no less important points, such as width, depth and angle of the furrow turned, and the best kind of implement to use for the special purpose, will be found largely a matter of individual preference, or local custom. Custom rather than principle seems to underly practice, and even custom has many variants, and a delightful elasticity in aim and practice is the result!

Comment has often been made in the diversity of farm practice, and can it be wondered at when there is so little underlying principle on which practice should be founded? Difference of soil and climate do not account for anything like the whole of the differences which are to be found broadcast through the country. This applies to most branches of farming, not merely to tillage, and illustrates my contention regarding tillage. It is the logical outcome of the extreme individualism that has characterized husbandry from its hoary past. History has repeatedly reminded us of it, and it will be long before the effects of this variation cease to show themselves in farm practice.

What is the immediate result of this mental inertia, or disregard of principles in their craft, on the part of so many farmers? It is often seen in the bad ploughing, which characterizes some districts, and to which farmers seem to have got accustomed, if not indifferent, of late years. This reacts on the seed bed, and consequently on the fate of the crops, many of which are much dependent on this vital point. In other districts a very different standard of ploughing prevails, but the finer points of tillage are perhaps unknown or disregarded. How many grow the best malting barley, for example? Barley is a crop well known to be highly dependent on a good seed bed, and failure, even in such a matter as the choice of roll or

harrow for the final operations has recently been said in good authority to be of sufficient importance to make or mar the crop.

This is a little dogmatic, perhaps, as season is so potent, yet not so potent as farmers love to maintain, because really good tillage marvellously assists or guards against nature's genial or adverse moods, and the latter are not quite to be regarded as a cloak that may overshadow and upset all human effort in bad seasons. It is a fact, however, that the two operations named have a vast effect for good or ill on most crops, and that a thorough working knowledge of their effects, relative and absolute, constitutes much of the complete equipment of the tiller of the soil. The importance of tillage has probably been recognised for a thousand years, yet if we ask a farmer which of these two operations should come first we shall probably get as many answers one way as the other. Many crops are injured in tricky seasons for want of judicious use of the right implement at the right time, and this not always from want of care. The land may be plastered down, or opened up too much, conditions which are fraught with much consequence at harvest. What subject could be more severely practical, from a financial standpoint or otherwise? A sound knowledge of soil physics would explain the reasons for sound practice, and the avoidance of unsound.

The importance of such earth knowledge is recognised in tropical countries, where, if care be not taken to preserve moisture in the soil, growth must cease. Hence "dry farming" has to be carried on on scientific lines, and I have seen better results obtained from seemingly acid plains than are sometimes obtained in our humid climate.

Theoretical instruction is not, therefore, to be despised in connection with farming, which is the mother of all the arts, and it has recently been well remarked in connection with another branch of this all-wide subject—valuing—that some of its practitioners, wedded to rule of thumb would be more practical if they could be induced to be more theoretical.

Let us glance at the subject from another practical point of view—livestock. A first rate judge is probably born and not made, with horseflesh especially, and few attain to high excellence here. But how many farmers have such want of confidence in their own judgment that they systematically employ others to do the work which special education might have assisted them to accomplish for themselves? Many we find. If certain standards of excellence are agreed upon why not convey them to students in as practical a manner as possible? This is now more commonly done than it

used to be, owing partly to its popularity in the United States, but it was formerly, and even, I believe, now, in some places of learning, very different, the points, fancy and otherwise, of numerous breeds being taught rather than the basal ones common to all. Could anything be more illogical than a prospective farmer in the South being *au fait* in theory with the points of a Shetland or Welsh sheep, and ignorant of what to look out for in buying or selling mutton or wool? There is no reason why such instruction should not be given in concise form in the lecture room, provided it is illustrated on the animal outside as well.

A striking instance of the practical results of such so-called theoretical knowledge was related to me recently. A lady teacher derived much benefit from a course of instruction on paper on the points of livestock. At the local market she demonstrated so well her knowledge of the practical points of a sheep she was buying that a farmer, who was sceptical of her attainments in this line, took off his hat to her, remarking that he had changed his views in regard to her capacity. I am informed that enterprising English farmers voluntarily undergo courses of postal instruction along American lines conducted in this fashion, and if such vocational training can be reduced to an art acceptable to farmers is there any reason why the same thing should not be a success at the University or college?

Much indeed of the more elementary part of the necessary equipment might, surely, be learnt at school, by an early and pleasant introduction to the secrets of Nature that would serve to waken the intelligence and stir the imagination of the country lad in a way which would hardly be possible in adolescent life. This would lead naturally and easily to a later course of vocational training, which would then have much fuller meaning and carry greater weight than the forcemeat system of the present agricultural college, its ill-assimilated mass of facts and figures, often merely memorized for the weekly terminal exam, and as soon forgotten.

We require, if we are to keep pace with foreign nations, to get rid of the old idea that no knowledge is worth having in agriculture that is not the result of experience. If the theory of the farmers' calling rather than a detailed acquaintance with cognate science can be crystallized into a year or two's comprehensive study, many of the losses inseparable from years of empirical effort or merely academic study could be forestalled and saved to an already impoverished industry. The prejudice referred to was illustrated to me some years ago on hearing the son of a yeoman farmer and sheepbreeder of repute say that he knew nothing of oat cultivation,

as they always grew barley. He acted as bailiff to his father, and had done well at a big public school, but he had never had the curiosity to look beyond his own gate!

As regards tillage, sound early training in its principles seems to be particularly advisable, for of all branches of Agriculture this is perhaps the hardest to acquire from observing practice, and for the reasons already set forth. Anyhow the writer has found it so, in spite of a life acquaintance with farming. The average farmer is not an adept at his calling, and, considering the wide range of knowledge required to become familiar with the sciences and arts involved in its mastery, this is not surprising in view of the attitude of many towards its vocational study.

VII.—THE IMPROVEMENT OF POOR PASTURES, WITH SPECIAL REFERENCE TO THE MANURING OF ACID PASTURES.

By T. Wallace, M.Sc., M.C.

At a meeting of the Experiments Committee held on January 16th last, it was resolved to initiate a series of experiments on the "Manuring of Acid Pastures."

The experiments have been taken in hand as a part of the problem of the "Improvement of poor Moorland Pastures, with special reference to Bracken Eradication," which the Committee has been investigating during the last three seasons, in view of certain results which have been obtained with manures in the experiments carried out to date. These results are reported in the Society's Journal, Fifth Series, Vol. XVIII, 1923-24.

Consideration of these results has led to the conclusion that in most cases where tracts of bracken are cleared by cutting, it will generally be necessary to effect improvement of the herbage of the cleared areas by manuring, and it was therefore decided that before experiments on a relatively large scale were commenced on the eradication of bracken, it was important to know what system of manuring would be the most likely one to produce the greatest improvement in the herbage. Further, as the soil conditions of bracken infested areas in this part of the country are in general

extremely sour, it was decided that the immediate problem to be investigated was that of the manuring of grassland in cases where the soils were acid in reaction.

It was resolved therefore to lay down experimental plots, not exceeding 20 in number, and on types of soil situated on different geological formations in order that the results might be very widely applicable.

The selection of the plots was left to Messrs. H. B. Napier and T. Wallace.

Scheme of Experiment.

In the previous series of experiments, ground quick lime, high grade basic slag and Nauru phosphate had been used and of these it was found that basic slag produced improvement at all centres, Nauru phosphate some improvement at two centres and ground lime no improvement at the only two centres where it was applied.

Some difference of opinion is held by various experimenters on the value of lime and various forms of phosphatic manures for effecting improvement in sour pastures and thus it was thought that, in this series of experiments, the best plan would be to compare the results obtained by various forms of phosphates used alone and with lime and by the use of lime alone.

The various phosphatic fertilisers which it was decided to test were high grade basic slag, superphosphate and ground North African phosphate. The lime to be used was to be high grade ground quick lime.

The various phosphates were to be applied at rates to supply 150 lbs. of phosphoric acid (P_2O_5) per acre—roughly equivalent to a dressing of 30% T.P. material at 10 cwts. per acre—and the lime at the rate of two tons per acre where the soils were judged to be strongly acid and at one ton per acre where the soils were less acid.

The degree of acidity was to be determined by using the Hutchinson-McClennan method of determining Lime Requirements. Strongly acid soils were those showing a lime requirement of 0.30% or over.

The different phosphatic manures were to be applied to plots each $\frac{1}{2}$ acre in area— $2\frac{1}{2}$ chains long by 1 chain wide and separated by strips $\frac{1}{2}$ chain wide. The lime was to be applied in a continuous strip across one half of each of these plots and across one half of each of the strips receiving no phosphates and separating the phosphatic plots—i.e., total area of $\frac{1}{2}$ acre.

The plan thus allowed for a comparison of plots receiving the different phosphatic manures used alone and with lime and with

plots receiving lime alone and others receiving no manure whatsoever.

The Experimental Centres.

Following out the instructions of the Committee nine centres were selected during the early months of the year in the neighbourhood of Bristol and the appropriate manures were applied to these in the spring. Two further centres were selected during the summer and the manures will be applied to these during the course of this winter.

The list of centres selected to date is as follows :—

LOCALITY.	Geological Formation from which soil derived.
Malmesbury, Wilts (2 centres)	Oxford Clay
Pewsey, Wilts	Upper Greensand
Backwell, Somerset	Coal Measures
Bridgtown, near Dulverton, Somerset ..	Devonian
*Rodhuish, Somerset	do.
Shepton Mallet, Somerset	Old Red Sandstone
Woolaston, Gloucestershire	Severn Alluvium
Frampton Cotterell, Gloucestershire ..	Coal Measures
Acton Beauchamp, Herefordshire	Old Red Sandstone
*Pencombe, Herefordshire	do.

*Manures not yet applied.

In the selection of these centres an attempt has been made to achieve the following objects :—

- (1) To obtain centres scattered over as large an area as is possible to supervise.
- (2) To select fields which are representative of fairly large areas.
- (3) To obtain centres where the soil conditions differ widely from each other in type or acidity and where the question of the best method of improvement is problematic.

It has also been borne in mind that the previous experiments have provided a certain amount of data regarding certain types of soil and such types have been avoided in selecting the present centres.

Although several of the centres are situated on the same Geological Formations,—2 on Oxford Clay, 2 on Coal Measures, etc.—consideration of the soil data given below will show that the soils at these centres differ in character.

The following is a very brief description of the centres with a few notes on the condition of the herbage, etc., at the time of taking over the land for experimental purposes.

Malmesbury, Wilts (2 centres.)

Both centres are situated on the same farm.

The first is a field which is said to have once been under cultivation and to have been let down to grass. When taken over, the surface of the field was quite bare excepting for the presence of some dried out mosses and lichens and some stunted gorse bushes. Grass has almost entirely disappeared from the field and it affords no keep whatsoever for stock.

The farmer had previously tried various means of improving the field but without effect. As will be seen from the soil data below the soil is extremely acid.

The second centre is better than the first and is in an adjoining field. The area has been cleared recently from gorse bushes and "burnt over." The herbage consists mainly of hard wiry grass, gorse shoots, etc., and is quite unpalatable to any kind of stock. The reason for selecting this centre in addition to the first was because it was thought that it might provide the key to the treatment to the first should the results on No. 1 be negative.

Pewsey, Wilts.

A large proportion of this field is covered with a strong growth of gorse about 10 feet high. The herbage is exceedingly poor and consists chiefly of hard wiry fescue and weeds. There are occasional clover plants. The adjoining field is covered with a strong growth of bracken.

Backwell, Somerset.

This field is a typical example of a low-lying field on the Coal Measures clay. The drainage of such land is very bad and the quality of the herbage is generally exceedingly poor. Most of the field lies wet in rainy weather. The herbage is very poor, full of weeds and practically devoid of clovers.

Bridgtown, Dulverton.

This field is typical of a very large area of hill land on the borders of Exmoor and occupying the southern half of the Devonian area between Minehead and Dulverton. Much of this land is infested with bracken and is very sour. The field has been partly cleared from bracken and is said to have been slagged some years ago but

not to have responded to the treatment. The herbage is poor and the field, although on a very steep slope, lies wet.

Rodhuish, Somerset.

This centre is situated on the hills immediately behind Dunster and at a very high altitude. It is typical of the poorest hill land of that area and has only recently been cleared of gorse bushes. The herbage at present is practically worthless and consists mainly of fescues, potentilla, gallium, gorse shoots, etc., with a thick mat of moss.

Shepton Mallet, Somerset.

This pasture is typical of the Old Red Sandstone land occurring in patches at various points on the Mendip Hills. Such pastures generally occur at high altitudes and are extremely poor, the grass generally being hard and coarse and often the areas are infested with bracken.

Woolaston, Gloucestershire.

This is an extremely poor field, the herbage of which consists chiefly of bent grass. It is situated quite close to the edge of the river Severn and is typical of the low-lying land of the district which is notoriously sour.

Frampton Cotterell, Gloucestershire.

This pasture is typical of much of the grassland situated on the Coal Measures between Bristol and Yate. The grass is poor and there is practically no clover present in the herbage.

Acton Beauchamp, Herefordshire.

This field is situated at a high altitude and the herbage of it is extremely poor. Stock are said to do very badly on the field and do not keep down the growth of coarse hard herbage. Bracken is growing to a height of six feet in the hedges.

Pencombe, Herefordshire.

This pasture is also situated at a high altitude and is very exposed. There is a fairly dense growth of bracken over the greater part of the field, which bracken is cut over every year after harvest. The plants made from one foot to two feet growth during the past season. The herbage is very poor, the flora being typical of an extremely sour pasture.

THE SOILS OF THE EXPERIMENTAL CENTRES.

It is proposed to make a detailed study of the soils of the selected centres at the University of Bristol Agricultural and Horticultural Research Station, Long Ashton, with a view to obtaining detailed information regarding the physical and chemical characteristics of the soils and to examining certain effects which the manures produce on certain of the soil conditions.

This work is now in progress and the data obtained to date are presented in Tables I, II, and discussed below.

Further data will be presented in future reports as they become available.

SOIL DATA.

Malmesbury, Wilts. Centres No. 1, No. 2.

The soils of both of these fields are stiff Oxford Clays, No. 1, especially being of a heavy impervious nature. No. 2 contains a much higher percentage of organic matter than No. 1, the former being covered with a mat of tufty grass, whilst the surface of the latter is practically devoid of vegetation other than mosses and lichens. The amounts of citric soluble potash and phosphoric acid are higher in No. 1 than No. 2, being low in the latter, whilst both soils show very large lime requirements.

Pewsey, Wilts.

The texture of this soil is very loose and open. Both surface soil and subsoil contain over 70% of fine sand and approximately 1% of clay. This case is thus an interesting one from the point of view of its response to phosphatic manures, as this type of soil is not generally regarded as one which is likely to respond to basic slag.

Chemically, the soil show a fairly high lime requirement and the figure for citric soluble phosphoric acid is low.

Backwell, Somerset.

This is another example of a "clay" soil, the subsoil in certain areas of the plots consisting of typical yellow Coal Measures clay.

The surface soil contains plenty of organic matter, mostly but little humified. The "available" phosphoric acid is again low, whilst the lime requirement denotes fairly strongly acid conditions.

Bridgtown, Somerset.

This soil is a typical Devonian Slate soil and although it does not show a high percentage of clay in either surface soil or subsoil,

TABLE I.—MECHANICAL ANALYSES OF THE SOILS OF THE EXPERIMENTAL CENTRES.

Samples—air-dried for analysis.

Centres.	Malmesbury, Wilts. No. 1 %	Malmesbury, Wilts. No. 2 %	Pewsey, Wilts. %	Backwell, Somt. %	Bridgtown, Somt. %	Shepton Mallet, Somt. %	Woolston Glos. %	Frampton Cotterell, Glos. %	Acton Beauchamp, Hereford %
SURFACE SOILS—									
Stones in Sample	nil	nil	nil	nil	9.0	11.0	16.0	0.5	nil
Fine Gravel ..	2.09	0.63	0.51	nil	9.59	1.26	3.13	0.15	0.15
Coarse Sand ..	1.19	1.28	3.87	2.67	4.55	3.91	33.75	6.88	12.73
Fine Sand ..	12.00	20.20	74.32	20.50	11.50	30.13	25.18	29.66	46.87
Silt ..	14.73	11.85	6.80	13.65	11.90	18.10	16.02	18.97	11.10
Fine Silt ..	27.80	24.80	5.33	22.60	26.65	13.77	9.90	21.40	12.93
Clay ..	26.50	15.75	0.55	21.38	7.98	12.53	8.18	9.68	8.10
Subsoils—									
Stones in Sample	nil	nil	nil	nil	19.0		20.0	0.4	nil
Fine Gravel ..	0.50	1.23	0.77	nil	16.83		4.25	0.41	0.08
Coarse Sand ..	0.96	1.45	3.91	2.60	7.01		34.48	9.42	4.29
Fine Sand ..	9.56	19.36	75.78	22.64	11.26		21.82	30.48	50.89
Silt ..	12.40	13.15	6.60	19.10	8.72		11.25	18.20	9.75
Fine Silt ..	25.84	25.25	6.02	21.55	29.38		11.10	21.18	14.95
Clay ..	38.85	24.70	1.03	24.60	9.10		12.25	12.30	13.30

TABLE II.—CHEMICAL ANALYSES OF THE SOILS OF THE EXPERIMENTAL CENTRES.

	Malmesbury, Wilts, No.1	Malmesbury, Wilts, No.2	Pewsey, Wilts.	Backwell, Somt.	Bridgton Somt.	Shepton Mallet, Somt.	Woolaston Glos.	Frampton Cottrell, Glos.	Acton Beauchamp Hereford
	%	%	%	%	%	%	%	%	%
SURFACE SOILS—									
Moisture ..	7.69	9.34	2.39	5.56	14.34	10.15	1.80	2.19	4.68
Loss on Ignition ..	7.76	14.00	4.20	11.87	10.75	9.24	2.81	10.70	3.44
Potash Total (K ₂ O) ..	—	—	—	—	—	—	—	—	—
* .. available (K ₂ O) ..	0.0112	0.0091	0.0134	0.0102	0.0088	0.0068	0.0128	0.0148	0.0082
Phosphoric Acid Total (P ₂ O ₅) ..	—	—	—	—	—	—	—	—	—
* .. available (P ₂ O ₅) ..	0.0144	0.0085	0.0081	0.0088	0.0144	0.0097	0.0076	0.0066	0.0060
Carbonate of Lime ..	nil	nil	nil	nil	nil	nil	nil	nil	nil
† Lime Requirement ..	0.96	1.06	0.323	0.48	0.596	0.61	0.247	0.387	0.182
SUBSOILS—									
Moisture ..	6.05	6.71	1.13	3.90	8.96	—	3.19	1.52	3.72
Loss on Ignition ..	5.55	9.06	2.48	5.43	7.26	—	2.95	4.90	2.75
Potash Total (K ₂ O) ..	—	—	—	—	—	—	—	—	—
* .. available (K ₂ O) ..	0.0108	0.0042	0.0115	0.0073	0.0075	—	0.0075	0.0086	0.0056
Phosphoric Acid Total (P ₂ O ₅) ..	—	—	—	—	—	—	—	—	—
* .. available (P ₂ O ₅) ..	0.0065	0.0062	0.0073	0.0047	0.0130	—	0.0056	0.0026	0.0032
Carbonate of Lime ..	nil	nil	nil	nil	nil	—	nil	nil	nil
† Lime Requirement ..	1.22	0.98	—	0.23	—	—	—	—	—

* Denotes soluble in 1% Citric Acid solution.

† Hutchinson-McClennan Method.

the soil is very sticky when wet, probably due to the high percentage of fine silt present.

The subsoil in places is of a brashy slaty character.

The soil contains much organic matter, the citric soluble phosphoric acid is moderate and the lime requirement is high.

Shepton Mallet, Somerset.

This is a thin soil—generally only about six inches deep—overlying massive Old Red Sandstone rock. The soil contains a fair amount of broken fragments of the rock and is difficult to sample evenly. The mechanical analysis shows the surface soil to be a fine sandy loam of good texture. The percentage of organic matter is fairly high, the amounts of citric soluble potash and phosphoric acid are low and the lime requirement is high.

Woolaston, Gloucestershire.

This soil contains many pebbles and fragments of sandstone, and these, together with its high content of coarse sand, make it light and open in texture. The appearance of the soil suggests that it has been largely derived from the Old Red Sandstone beds adjoining the area of alluvium to which the soil belongs.

The amount of organic matter in the soil is small, the percentage of citric soluble phosphoric acid is low and the lime requirement is only moderate.

Frampton Cotterell, Gloucestershire.

This soil, which is derived from the Coal Measures Formation, is lighter than that at Backwell. This is no doubt due to the fact that this land is largely derived from the Pennant Sandstone, though pockets of Coal Measures Clay are found in patches. It may be described as a fine sandy loam.

Its content of organic matter is fairly high, the citric soluble phosphoric acid is low and the lime requirement denotes fairly strongly acid conditions.

Acton Beauchamp, Herefordshire.

The soil of this field is extremely sandy in parts, but the sandy deposit is relatively thin and shades away, overlying a bed of old Red Sandstone Marl. On the plots, the sandy condition predominates in both surface soil and subsoil, but patches of marl are present in the subsoil of one area on the centre phosphate plot (superphosphate plot). It will be seen from the table that the samples taken contained about 50% of fine sand.

The amounts of organic matter contained in both the surface soil and subsoil samples are low, whilst the amounts of citric soluble potash and phosphoric acid are relatively small. The lime requirement suggests only moderately acid soil conditions.

PROGRESS REPORT FOR SEASON 1924.

(a) *The Manures used and their Application.*

In accordance with the proposed scheme of manuring, the following quantities of manures were applied to the respective plots at the various centres on the dates shown in the table below.

MANURES APPLIED.

	cwts.	lbs.
Basic Slag (36% T. P.) on $\frac{1}{4}$ acre plot ..	2	3
Superphosphate (35% T. P.) ..	2	11
North African Mineral Phosphate (58% T. P.) on $\frac{1}{4}$ acre plot ..	1	30

These materials were applied at the above rates at all centres. The North African Phosphate was only guaranteed to the fineness of 80% passing the 100 mess sieve, but was considerably finer than this.

Ground quick lime (highest grade) on $\frac{1}{2}$ acre plot was applied at the rate of two tons per acre at all centres excepting Woolaston and Acton Beauchamp, where the rate was one ton per acre.

DATES OF APPLICATION OF MANURES.

CENTRE.	Date of application of Phosphates.	Date of application of Lime.
	1924	1924
Malmesbury, Wilts, No. 1	March 19	March 19
" " No. 2	" 19	" 19
Pewsey, Wilts	" 20	" 20
Backwell, Somerset	" 11	" 11
Bridgtown, Somerset	" 18	" 18
Shepton Mallet, Somerset	Feb. 27	April 10
Woolaston, Gloucestershire	March 21	March 21
Frampton Cotterell, Glos.	" 24	" 26
Acton Beauchamp, Hereford	" 17	" 17

(b) *Action of the Manures During the Season 1924.*

The various plots have been visited from time to time during the course of the season and the observations made on these occasions on the action of the manures are recorded below.

Malmesbury, Wilts, No. 1. The date of the last observation was September 9th. No results were apparent on that occasion.

Malmesbury, Wilts, No. 2. Up to September 9th no definite improvement was noted.

Pewsey, Wilts. As early as June 24, marked improvement was noted on the "slag alone" plot, clover development being good. Slag plus lime treatment was less effective.

On September 28th the slag plot was closely grazed and covered with clover. The improvement was far ahead of the other plots.

Superphosphate and mineral phosphate plots showed slight improvement, the mineral phosphate plot being slightly the better of the two plots. The action of lime was doubtful. The unmanured plots were as poor and ungrazed as before treatment.

Backwell, Somerset. Marked improvement was noted on the superphosphate plus lime and the superphosphate alone plots on June 27th. These plots were very closely grazed and full of clover. The slag plus lime plot showed some improvement but was far behind the superphosphate plots. The mineral phosphate plots showed no improvement over the unmanured.

On September 10th the superphosphate plus lime and superphosphate alone plots were closely grazed over the whole of their areas and there was a thick growth of white and red clover over the plots.

The slagged plots were slightly behind the superphosphate plots, but the herbage of these was also full of clover and it is probable that the slagged plots before treatment were covered with a much coarser type of herbage than were the superphosphate plots.

There was some slight improvement noted on the mineral phosphate plots.

The condition of the lime alone plots was similar to that of the unmanured plots, the herbage remaining poor and bronzed.

There were no differences noticeable on the phosphate plots between the limed and unlimed portions.

Bridgtown, Somerset. This centre was only visited on one occasion during the season, on October 2nd. The plots to that date had not been sufficiently stocked but will be stocked during the winter. The herbage on the plots was long and there was a fair growth of bracken on them.

Some improvement was noted on all of the phosphate plots, the order of improvement being slag, superphosphate, mineral phosphate.

The limed plots showed no improvement.

Shepton Mallet, Somerset. On June 22nd, the superphosphate plots, especially the limed portion, showed marked improvement. On this date there was only slight improvement on the slagged plots and practically none on the mineral phosphate plots.

By September 9th the superphosphate plots were in excellent condition, being very closely grazed and full of clover. There was practically no difference between the condition of the limed and unlimed portions. The slagged plots also showed marked improvement but were definitely behind the superphosphate plots. Definite improvement was also noted on the mineral phosphate plots, though they were well behind the slagged plots. Lime alone showed no improvement and no difference was discernable between the phosphates plus lime and phosphates alone treatments.

Woolaston, Gloucestershire.

A visit was paid to this centre on October 3rd. On that date the slag alone plot was far ahead of the others, with slag plus lime second. These plots, especially the former, were well grazed and the herbage contained much clover.

The mineral phosphate alone plot was next in order of improvement, followed by the superphosphate alone. The limed portions of these plots did not show much improvement over the unmanured plots.

Lime alone plots showed no improvements.

Frampton Cotterell, Gloucestershire. Visits were paid between May 12th and September 11th. Improvements were first noted on August 1st when the slag plots and superphosphate plots showed considerable improvement, the herbage containing much clover. The mineral phosphate plots showed no improvement on this date nor did those receiving lime alone.

On September 11th all the phosphate plots showed a fair development of clover, whilst there was practically no clover visible on the unmanured and lime alone plots. There were no noticeable differences between the phosphates plus lime and phosphates alone plots. The superphosphate plots were perhaps the best.

Acton Beauchamp. This centre was visited on September 5th. The field had been grazed only for a few days previous to that date and hence the herbage over the field was very long. The cattle, which had just been turned into the field had, however, commenced grazing solely on the phosphate plots so that they showed the rather remarkable spectacle over their areas of patches of herbage grazed to the ground and surrounded by growth of long grass.

The herbage of all the phosphate plots contained much clover and the quality of the grass looked much superior to that of the untreated plots. The best plots were those receiving superphosphate plus lime and slag alone. Lime alone showed no improvement over the unmanured plots.

SUMMARY.

While it is too early at this stage to draw any conclusions regarding the action of the manures, it may be said that the results obtained over the season point to the fact that rapid improvement is most likely to be obtained in these experiments by the use of phosphatic manures—especially basic slag and superphosphate.

Treatment with Lime alone has not produced any visible improvement at any centre.

At two centres no improvement has been effected by any treatment over the first season.

VIII.—THE SOCIETY'S EXHIBITION AT TAUNTON.

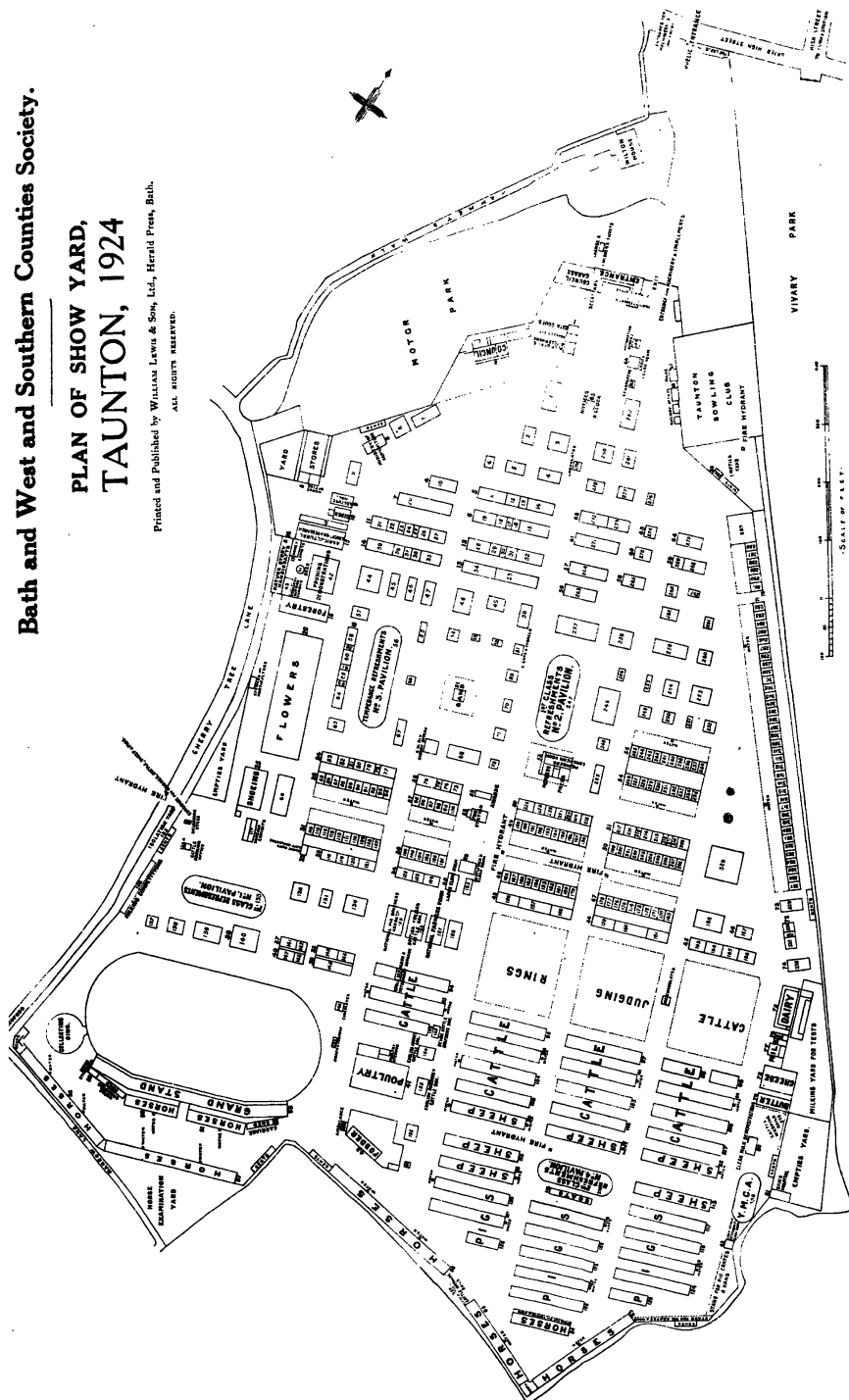
By F. H. Storr.

After a lapse of nearly thirty years the Society was again invited to visit the capital of the home county where it was warmly welcomed, and may congratulate itself on the large measure of success which attended the Meeting in a year when many Agricultural Societies have had to report financial losses and even worse failures. The menace of Foot and Mouth Disease hung over the Show, and might at any moment have prevented the exhibition of any cattle, Sheep or Pigs. However, the Committee of the Somerset County Council, while taking every reasonable precaution, saw no reason why the Show could not safely go forward, and the Society's Stewards, energetically seconded by the officials of the Great Western Railway Company, enforced the most stringent methods of preventive disinfection that could be devised. The result justified the courage of the authorities concerned, no outbreak occurring which could by any possibility be traced to the movement of Stock to and from the Show, although twenty-three counties contributed to the exhibits.

The Show was formally opened on May 27th, by the Mayor of Taunton, who was received by the President, Sir Dennis F. Boles, Bart., C.B.E., D.L. It was claimed for Taunton that as the town first visited by the Society when it journeyed outside the city of its birth, she stood in the position of foster-mother to the Bath and West, a claim amply substantiated by the cordiality of the welcome given, and the energetic responses made to all calls upon the town or the Local Committee. The site chosen for the show could hardly have been bettered. There was ample space, a good ring, and fine timber, while the slope of the ground was not sufficient to cause any difficulty in the laying out of the yard. A new entrance was made from the High street to the ground by the Local Committee, and the bridges erected over the big ditch which crossed the ground were handed over to the town by the Society as a testimony to the success of the Meeting. It will not be out of place here to make a reference to the finances of the Show. A small balance will stand to the credit of the Society, and it may be claimed that two satisfactory conclusions can be drawn from this fact; first, that it is possible to profitably visit essentially agricultural centres without loss, though the population may not be large, and second, that the charges made by the Society for space and for entry fees are by no means unduly onerous.

PLAN OF SHOW YARD,
TAUNTON, 1924

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The stock exhibits would have constituted a record had it not been for the Ministry's restrictions on the movement of stock owing to Foot and Mouth Disease, and to further restrictions imposed by some County Councils from fear of infection. Owing to these causes about two hundred animals were not shown, but the quality of the exhibits actually present was fully up to the usual standard. For the first time selling classes were introduced for army remounts, and proved to be a popular innovation. Owing to the energy of Captain Orr Ewing, the local remount officer, there was a display of gun teams so that the exhibitors might judge the type of animal desired. For the first time also, Classes were provided for Ayrshire Cattle, signalling the coming to the South of the famous dairy breed. The following comparative figures for the last three Taunton Shows indicate the large entry received.

							TAUNTON.		
							1870	1895	1924
HORSES—(with Boxes)—									
Agricultural							24	72	33
Hunters, Hacks and Ponies							58	57	102
							—82	—129	—135
CATTLE—									
Devons							38	48	69
South Devons							—	—	15
Shorthorns							32	68	47
Dairy Shorthorns							—	—	61
Herefords							35	38	30
Sussex							13	34	10
Red Poll							—	—	21
Aberdeen-Angus							—	4	38
British Friesian							—	—	48
Ayrshire							—	—	11
Welsh Black							—	—	19
Jersey						}	14	163	86
Guernsey								71	64
Kerry and Dexter								41	50
Dairy							—	23	12
							—132	—490	—581
SHEEP							218	212	100
GOATS							—	—	27
PIGS							88	—	412
POULTRY							243	406	448
FARM PRODUCE—									
Cheese							—	164	93
Butter and Cream							—	217	73
Cider							—	39	44
								—420	—210
							882	1664	2012

The distribution of the prize money, £4525 5s. 0d. to the various breeds and competitions will be found in the previous issue of this Journal.

IMPLEMENTS.

There was a large increase on the previous year in the space taken for implements, while the excellent Show Yard again allowed of their display to the best advantage. Pig feeders, hay-making machinery and dairy equipment were perhaps most in evidence, and there were several new inventions, notably a cabbage planter and a farmyard manure spreader. The record of business done was in many instances considerable, and reflected the preponderatingly agricultural interests of visitors to the Show. The comparative figures for the last three Taunton Shows are as follows :-

		TAUNTON.		
		1870	1895	1924
Machinery in Motion	feet run	700	1190	1876
Agricultural Implements	"	5906	4550	1770
Other Exhibits not strictly Agricultural	"		710	
Seeds, Cattle Foods, Artificial Manures, etc.	"		877	1447
		6606	7327	5093
Open Space for Farm and Horticultural Buildings, etc	sq. feet	2594	18150	55281

GENERAL REMARKS.

For the first time since 1915, Mr. H. M. Cundall, I.S.O., F.S.A., was able to exercise his second stewardship, by providing a band, and the 1st Batt. P.A. Somerset Light Infantry played an excellent selection of music during the show. This was possible owing to a change in the regulations made by the Commissioners of Customs and Excise, exempting Agricultural Shows from the imposition of entertainments tax if a band was employed. Seats round the band stand were provided by the Society and were clearly much appreciated by many visitors. The plan of the Members and press pavilion was improved so as to give greater privacy and convenience to the Members of the Bath and West, and considerable use was made of the members' room.

Three addresses were again delivered in the Show Yard, the first by Mr. H. P. Hutchinson on the Basket Willow, in connection with part of the exhibit sent in by the Research Station at Long Ashton, one of the best exhibits in the Show Yard. The Society's old friend, Professor R. G. Stapledon, spoke on the laying down of land to grass, and Dr. J. A. Hanley on the economic aspects of liming. Although the printing and circulation of these addresses ensures a wide

publicity, it is a matter of regret that the number of people who attended their actual delivery was so small.

Mention has already been made of the precautions taken against Foot and Mouth Disease. These, involving as they did the laying down of sawdust impregnated with disinfectant and the spraying of the feet of every animal brought into the yard, and the vehicles in which they were conveyed, were a considerable tax on the Yard and Stock Stewards, and emphasised the need of a whole time veterinary surgeon, especially during the time when stock is coming into the Yard.

All those features which make the Society's Shows so valuable from an educational standpoint were continued. The Reading Institute have developed their demonstrations of Pure Milk Production into a fine art, and with the Working Dairy now form a complete instruction in the handling of milk. Mr. Hayden has completed his display of Shoeing Appliances with exhibits of all the latest devices for non-slipping shoes, which modern roadmaking has rendered so necessary. The Somerset Bee Keepers' Association not only organised the usual instruction in apiculture but provided a number of competitive Classes for honey which were excellently filled, while the Cannington Farm Institute undertook the pruning demonstrations, always a popular branch of instruction. By no means the least valuable educational work was undertaken by the Ministry of Agriculture, which in addition to their general exhibits, conducted demonstrations of Fruit grading and packing which were largely attended. It is gratifying to be able to add that the flower display was a most successful one, in spite of the concurrence of Chelsea, and that the Town of Taunton showed its appreciation of the value of the show by the establishment of a tent in the Show Yard to serve as a bureau of information in regard to the Town.

Finally, a word of praise must be given to two local bodies, the Y.M.C.A. and the Labour Bureau. The former body afforded excellent accommodation for Yard employees, and even went so far as to entertain them with a wireless installation and a loud speaker. The labour bureau tent outside the gates was most efficiently managed and was successful in supplying the want not only of the Society but of many exhibitors.

COMPARATIVE ENTRIES IN COMPETITIONS.

		TAUNTON.		
		1870	1895	1924
Butter-Making (Entries now limited) .. .. .	..	—	283	91
Milking .. .. .	..	—	17	13
Shoeing .. .. .	..	26	113	52
		26	413	156

ATTENDANCE.

The attendance at the Taunton Meeting, though not quite up to expectation, was a good one, and would have been much larger if the weather had been more settled. Though nothing but a shower or two fell during the actual hours when the Show was open, it is certainly a fact that visitors are kept away when there is a strong possibility of rain falling. Under these conditions an attendance of nearly 46,000 must be considered satisfactory.

NUMBERS OF ADMISSION.

NUMBERS OF ADMISSION, TAUNTON.			ADMISSION RECEIPTS, TAUNTON.		
1870	1895	1924	1870	1895	1924
51,605	43,292	45,963	£3.786	£3.181	£7.650

IX.—REPORT ON THE SOCIETY'S DAIRY DEPARTMENT
AT TAUNTON.

By A. F. Somerville, Steward.

The Dairy Department was divided as follows :—

1.—*Produce Department.*—For exhibits in sheds of Cheese, Butter and Scalded Cream.

2.—*Working Dairy.*—For Butter-making competitions and demonstrations given by members of the staff.

3.—*Test Department.*—For the “Milking Trials” and “Butter Test.”

4.—*Sales of Produce Department.*—Where milk bought from the yard, and its products made in the Working Dairy, were sold at “The Pavilion” adjoining the dairy.

5.—*Milking Competitions.*—For men, women, lads and girls.

6.—*Clean Milk Demonstrations.*—These were given in a separate shed near the dairy, under the supervision of The National Institute for Research in Dairying, Reading.

PRODUCE DEPARTMENT.

As might be expected in Somerset, the home of the Cheddar Cheese, the entry of this class of cheese was the largest that the

Society has had for many years. Of 80 entries only two were absent; at Swansea the entries were 32. There were 13 entries for Caerphilly Cheese, the same number as last year.

The Judge, Mr. A. Todd, British Dairy Institute, Reading, highly commended the cheese as a whole and said that the prize cheeses were of an excellent quality. He, however, pointed out that more care is still required in binding cheese.

The increase in the money offered for prizes no doubt attracted more exhibitors.

On the other hand, there was a falling off in the entries for butter, which fell from 93 at Swansea to 62 at Taunton. This may be due to Somerset farmers finding that butter-making is not so profitable as making cheese, also for some years past the County Agricultural Committee has abandoned its instruction in butter-making, except at the Cannington Farm Institute.

Mrs. Luke, Plymouth, the Judge, spoke highly of the exhibits of both Butter and Clotted Creams.

THE WORKING DAIRY

was under the control of Major A. H. Gibbs as Steward, with Miss G. D. Saker, Chief Dairy Instructress Somerset Farm Institute, Cannington, as Chief Assistant and she was helped by members of the dairy staff at Cannington.

A class for Children in butter-making on the first day failed to elicit any entries, so that day was occupied by the staff in giving demonstrations in butter-making, the making of Small Holders' cheddar cheese and making clotted cream, soft cheeses and junkets.

Similar demonstrations, and also in the making of Caerphilly cheese, were given at intervals during the other days of the Show when the staff was not occupied with the butter-making competitions.

There was a competition for those who had not previously won a prize for butter-making at the London Dairy Show or Shows of Bath and West or Royal Agricultural Societies. For this there were 20 entries; the Competition was excellent, the Judge commending the whole class. There were Competitions for past and present Students at any County Council School who had not previously won a 1st or 2nd prize at any of the Society's Shows; and there was an open competition for men and women. This latter was keenly contested, the work well done throughout, and highly praised by the Judge.

On the last day the Champion Class for the Society's Medals was held in the afternoon, 17 competitors taking part in it. Here

again the contest was very keen, Miss E. M. Mortimer receiving the Gold Medal; Miss P. E. Jackson the Silver Medal; Miss K. Davis the Bronze Medal; Miss E. M. Price being Reserve number.

Both the butter-making contests and the demonstrations created great interest and there was a full attendance at the Dairy during the week. It may be here observed that, though the making of butter at the present market price is not a profitable method of utilising milk, there will always be a fair demand for good butter-makers at private dairies; and many private houses and clubs are ready to give an enhanced price for really well-made butter. There is no doubt, too, that these butter-making contests are a great attraction at an Agricultural Show.

TEST DEPARTMENT.

The cows in the Milking Trials and Butter Test were stript and weighed on the second day and divided into two classes for both the Milking Trials and Butter Test respectively. Those under 950lbs. being placed in one class and those 950lbs. and over in the other.

The cows were stript at 5 p.m. on the second and milked at 7 a.m. and 5 p.m. on the third day, second milkers being taken half an hour later on each occasion.

MILKING TRIALS.

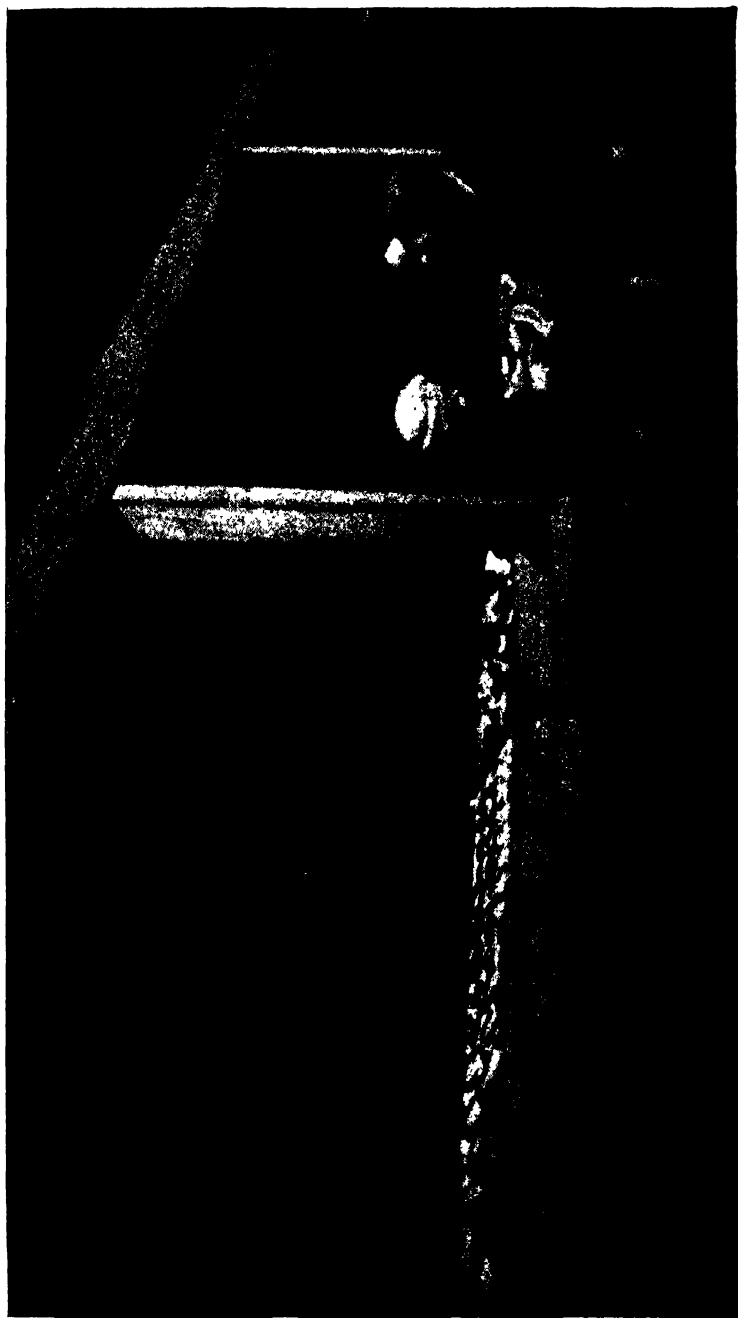
The milks were taken to the test room, after weighing, and tested immediately by a Gerber Tester: Mr. R. J. Kerr, Secretary of the Somerset and North Dorset Milk Recording Association undertaking this work. Any samples showing a deficiency in B.F. were at once submitted to a second test.

There were 63 entries for the Milking Trials but, chiefly owing to restrictions placed upon the return of cattle after the Show by several Counties in consequence of Foot and Mouth disease, only 34 animals were present to compete.

Of these 11 were placed in Class 134 under 950lbs. live weight, 10 being Jerseys and 1 a Kerry.

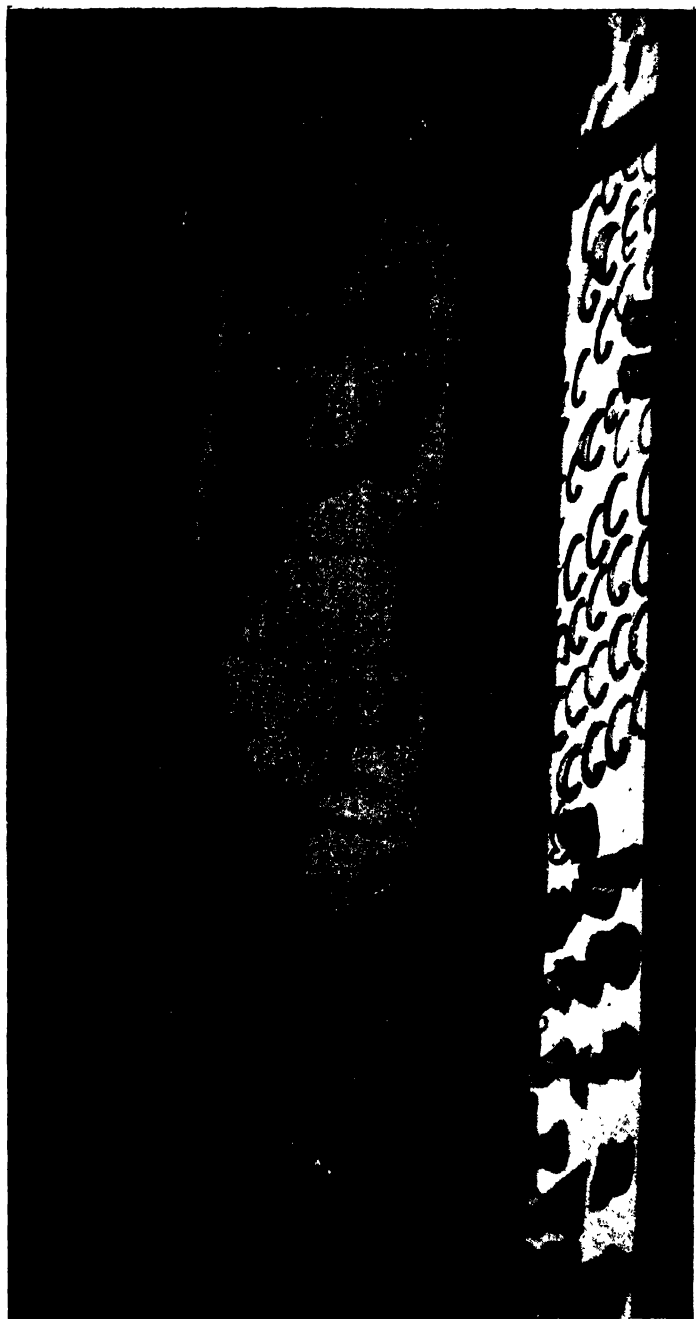
In Class 135 for cows 950lbs. and over live weight there were 23 cows competing, 7 British Friesians, 6 Shorthorns, 4 Devons, 2 Guernseys, 1 Jersey, 1 South Devon, 1 Red Poll, 1 Ayrshire.

The tables on pages 98-99 give the results.



FARRIERY EXHIBITION.

Bath and West and Southern Counties Show, Taunton, 1924.



FARRIERY EXHIBITION.
Bath and West and Southern Counties Show, Taunton, 1924.

The Average of the yields of the cows, together with their average days in Milk, and B.F. in these classes, is as follows :—

CLASS 134.	<i>Breed.</i>	<i>No.</i>	<i>Milk yield.</i>		<i>Days in Milk.</i>	<i>B.F.</i>
			lbs.	ozs.		
	Jersey	10	41	14½	104.92	4.55
	Kerry	1	34	8	134.	4.35
<hr/>						
CLASS 135.	British Friesian	7	61	15	89.57	3.08
	Shorthorn ..	6	56	9½	59.33	3.88
	Devons	4	44	13½	72.75	4.45
	Guernsey ..	2	41	13½	114.00	5.92
	Jersey	1	45	14	136.00	4.65
	South Devon ..	1	45	10	53.00	3.82
	Red Poll ..	1	48	0	156.00	5.05
	Ayrshire ..	1	39	0	88.00	4.15

It may be noted that Mr. Musgrave's Shorthorn, which was the Reserve Number in Class 135, won the first prize in the Butter Test. If quality, as well as quantity, had been taken into consideration, and the same points given for B.F. as are given by the Royal Agricultural Society in their Milk yield classes, there would have been no alteration in the Awards for Class 135, but in Class 134, though the 1st prize would have been given to the same cow, the other awards would have been materially altered. It will be a matter for the Society to consider whether or not, as a matter of principle in future, points should be awarded for B.F. in the Milking Trials.

BUTTER TEST.

This Test, which has been for some years confined to animals of the Channel Island Breeds and for prizes given by the English Jersey Cattle Society and the English Guernsey Cattle Society, was this year thrown open to all breeds. In addition to prizes given by the Bath and West Society in each of the two Classes, special prizes, for their own animals, were offered by the Devon. South Devon. British Friesian. Red Poll, and English Guernsey Cattle Societies, besides the Medals given as on former occasions by the English Jersey Cattle Society.

There were 61 entries for the two classes in the Butter Test, but for the reason stated as regards the Milking Trials, only 33 cows competed; 11 being in Class 136 for animals under 950lbs. live weight: 22 in Class 137 for those that were 950lbs. and over.

The milks, as in former years, after weighing were separated morning and afternoon, and the creams churned the following

MILK TEST.

No.	Owner and Cow.	Breed.	Date of Birth.	Date of last Calf.
CLASS 134				
509	G. Berry, "Golden Raspberry" ..	Jersey	29/12/20	9/2/24
513	Mrs. Evelyn, "Wotton Relustria" ..	Jersey	11/7/17	6/1/24
523	R. Bruce Ward, "Prometheus Queen"	Jersey	20/11/19	18/1/24
526	Mrs. O. Ames, "Fairy Winks" ..	Jersey	4/12/17	15/2/24
527	Mrs. H. Briggs, "Petumes Victory"	Jersey	26/8/18	31/3/24
530	G. Cross, "Eastern Queen Laxton"	Jersey	15/2/17	9/2/24
542	E. A. Strauss, "Sultan's Remembrance 6th"	Jersey	16/3/14	3/3/24
553	G. Berry, "Postmistress"	Jersey	23/1/22	16/1/24
660	Mrs. Freeland, "Kilmorna Primrose 17th"	Kerry	27/4/15	15/1/24
708	Mrs. O. Ames, "Frostie 4th"	Jersey	26/8/18	28/2/24
711	G. Berry, "Postage 2nd"	Jersey	18/4/18	16/3/24
CLASS 135				
142	J. H. Chick, "Wynford Dahlia" ..	Devon	15/1/20	15/4/24
143	J. H. Chick, "Wynford Pill" ..	Devon	23/7/13	6/5/24
146	R. A. Lee, "Ashford Lady" ..	Devon	26/6/15	22/2/24
147	N. D. Lupton, "Daisy"	Devon	14/7/18	22/1/24
213	W. Hunt, "Milkmaid 9th"	S.Devon	2/9/16	5/4/24
277	Kingsclere Farms, "Lady Dolphinlee Waterloo"	Fairy	14/3/17	13/4/24
278	Kingsclere Farms, "Ashton Red Duchess"	Shorthorn	12/9/16	18/5/24
282	Webbington Farms, Ltd., "Highworth Daisy 2nd"	Fairy	19/5/18	3/3/24
375	A. & L. Brown, "Hedges Bles. Julian"	B. Friesian	10/12/19	4/4/24
379	G. Holt-Thomas, "Colton Sunray"	B. Friesian	31/10/18	22/3/24
380	G. Holt-Thomas, "Brookside Bonnie Annie"	B. Friesian	7/3/19	30/3/24
386	H. H. Martineau, "Cymric St. Martha"	B. Friesian	24/1/17	7/12/23
388	A. H. Tarr, "Westfield Dinah" ..	B. Friesian	10/10/20	1/4/24
389	Mrs. P. C. Tory, "Terling Stella 8th"	B. Friesian	17/9/17	4/4/24
461	Major J. G. Dugdale, "Framlingham Proud Lass"	Red Poll	21/11/18	22/12/23
500	Lt.-Col. R. E. Cecil, D.S.O., "Eglintomains Blossom"	Ayrshire	2/10/19	1/3/24
514	Mrs. Evelyn, "Fairlawne Hussy"	Jersey	8/8/16	13/1/24
598	A. C. Beatty, "Flossy of Bella Cottage"	Guernsey	18/9/17	2/1/24
606	W. Dunhels, "Starlight Broom" ..	Guernsey	20/4/19	8/4/24
714	D. A. Musgrave, "Dairy Maid 1st"	Shorthorn	12/15	15/4/24
716	S. J. Sheppy, "Model Maid 11th" ..	Shorthorn	15/3/20	15/5/24
717	S. J. Sheppy, "Model Maid 8th" ..	Shorthorn	10/3/17	19/12/23
719	W. Turner, "Hawthorn Crocus" ..	B.Friesian	17/1/19	17/12/23

MILK TEST.

Days in Milk.	Milk Yield.	Lactation.	Total.	Awards.
	lbs. ozs.			
109	41 4	6.9	48.15	C.
143	30 0	10.3	40.3	
131	37 12	9.1	46.85	C.
103	51 8	6.3	57.8	First Prize
58	40 8	1.8	42.3	
109	33 10	6.9	40.525	
86	45 12	4.6	50.35	H.C.
133	41 4	9.3	50.55	Reserve
134	34 8	9.4	43.9	
90	49 8	5.0	54.5	Second Prize
73	48 2	3.3	51.425	Third Prize
	lbs. ozs.			
43	49 0	.3	49.3	
22	49 14	nil	49.875	
96	44 10	5.6	50.225	C.
126	36 0	8.6	44.6	
53	45 10	1.3	46.925	
45	42 8	.5	43.00	
10	60 12	nil	60.75	H.C.
86	73 0	4.6	77.6	Fat below standard
54	69 8	1.4	70.9	Fat below standard
67	72 14	2.7	75.575	First Prize
59	65 10	1.9	67.526	Fat below standard
173	62 6	12.0	74.375	Second Prize
57	50 4	1.7	51.95	Fat below standard
54	56 0	1.4	57.4	Fat below standard
156	48 0	11.6	59.6	C.
88	39 0	4.8	43.8	
136	45 14	9.6	55.475	C.
147	39 12	10.7	50.45	C.
81	44 0	4.1	48.1	
43	60 12	.3	61.05	Reserve
13	34 6	nil	34.375	
161	68 4	12.0	80.25	Fat below standard
163	57 4	12.0	69.25	Third Prize

£50 Special Prize Awarded by British Friesian Cattle Society.
 379 G. Holt-Thomas, "Colton Sunray" British Friesian. 75.575 points.

BUTTER TEST.**PARTICULARS OF COWS TESTED, YIELDS OF MILK AND BUTTER, AWARDS, ETC.**

No.	Owner and Cow.	Breed.	Date of Birth.	Date of last Calf.
CLASS 136				
509	G. Berry, "Golden Raspberry" ..	Jersey	29/12/20	9/2/24
513	Mrs. Evelyn, "Wotton Relustria" ..	Jersey	11/7/17	6/1/24
523	R. Bruce Ward "Prometheus Queen" ..	Jersey	20/11/19	18/1/24
526	Mrs. O. Ames, "Fairy Winks" ..	Jersey	4/12/17	15/2/24
527	Mrs. H. Briggs, "Petune's Victory" ..	Jersey	26/8/18	31/3/24
530	G. Cross, "Eastern Queen Laxton" ..	Jersey	15/2/17	9/2/24
542	E. A. Strauss, "Sultan's Remembrance 6th" ..	Jersey	16/3/14	3/3/24
550	E. A. Strauss, "Kingston Bounty" ..	Jersey	29/4/21	2/4/24
553	G. Berry, "Post Mistress" ..	Jersey	23/1/22	16/1/24
708	Mrs. O. Ames, "Frostie 4th" ..	Jersey	26/8/18	28/2/24
711	G. Berry, "Postage 2nd" ..	Jersey	18/4/18	16/3/24
CLASS 137				
142	J. H. Chick, "Wynford Dahlia" ..	Devon	15/1/20	15/4/24
143	J. H. Chick, "Wynford Pill" ..	Devon	23/7/13	6/5/24
145	W. D. Chick, "Compton Goody" ..	Devon	1/10/18	27/2/24
146	R. A. Lee, "Ashford Lady" ..	Devon	26/6/15	22/2/24
147	N. D. Lupton, "Daisy" ..	Devon	14/7/18	22/1/24
213	W. Hunt, "Milkmaid 9th" ..	S. Devon	2/9/16	5/4/24
277	Kingsclere Farms, "Lady Dolphinlee Waterloo" ..	D. Shorthn.	14/3/17	13/4/24
278	Kingsclere Farms, "Ashton Red Duchess" ..	D. Shorthn.	12/9/16	18/5/24
282	Webbington Farms Ltd., "Highworth Daisy 2nd" ..	D. Shorthn.	19/5/18	3/3/24
375	A. & J. Brown, "Hedges Bles Julian" ..	B. Friesian	10/12/19	4/4/24
379	G. Holt-Thomas, "Colton Sunray" ..	B. Friesian	31/10/18	22/3/24
380	G. Holt-Thomas, "Brookside Bonnie Annie" ..	B. Friesian	7/3/19	30/3/24
388	A. H. Tarr, "Westfield Dinah" ..	B. Friesian	10/10/20	1/4/24
461	Major J. G. Dugdale, "Framlington Proud Lass" ..	Red Poll	21/11/18	24/12/23
500	Lt.-Col. R. E. Cecil, D.S.O., "Eglintonmains Blossom" ..	Ayrshire	2/10/19	1/3/24
514	Mrs. Evelyn, "Fairlawne Hussy" ..	Jersey	8/8/16	13/1/24
598	A.C. Beatty, "Flossy of Bella Cottage" ..	Guernsey	18/9/17	2/1/24
604	J. B. Body, "Polly of the Isles of Goodnestone 3rd" ..	Guernsey	25/2/19	19/4/24
606	W. Dunhels, "Starlight Broom" ..	Guernsey	20/4/19	8/3/24
714	D. A. Musgrave, "Dairymaid 1st" ..	Shorthorn	—/12/15	15/4/24
717	S. J. Sheppy, "Model Maid 8th" ..	Shorthorn	10/3/17	10/12/23
719	W. Turner, "Hawthorne Cocus" ..	B. Friesian	17/1/19	17/12/23

*Special Prize, £5, given by Devon Breed Society,—146 and 147 :**Equal First, with 38.6 Points.**£5 5s. Special Prize, given by South Devon Breed Society.—213, with 34.55 Points.*

BUTTER TEST.

PARTICULARS OF COWS TESTED, YIELDS OF MILK AND BUTTER, AWARDS, ETC.

No. of Days in Milk.	Milk Yield in 24 Hours		Butter Yield.		Ratio, viz., lbs. Milk to lbs. Butter.	Points.			Awards.
						Lactation.	Butter.	Total.	
109	lbs. 41	ozs. 4	lbs. 2	ozs. 9½	15.9	6.9	41.5	48.4	1st Prize and Gold Medal. E.J.C.S. 3rd Prize & C.M. C.M. C.M.
143	30	0	2	3	13.7	10.3	35.0	45.3	
131	37	12	1	7¾	25.4	9.1	23.75	32.85	
103	51	8	2	2¾	23.7	6.3	34.75	41.05	
58	40	8	1	8¾	26.1	1.8	24.75	26.55	
109	33	10	1	15	17.3	6.9	31.0	37.9	C.M.
86	45	12	2	9½	17.6	4.6	41.5	46.1	2nd Prize and Bronze Medal E.J.C.S.
56	29	0	1	1½	26.5	1.6	17.5	19.1	
133	41	4	2	0½	20.3	9.3	32.5	41.8	Res. and C.M.
90	49	8	1	12½	28.1	5.0	28.25	33.25	
73	48	2	2	6	20.2	3.3	38.0	41.3	C.M.
43	lbs. 49	ozs. 0	lbs. 1	ozs. 12	28.0	.3	28.0	28.3	2nd Prize 3rd Prize & Sil. Med E.J.C.S. Reserve First Prize
22	49	14	2	4¾	21.8	nil	46.5	36.5	
91	40	0	1	15	20.6	5.1	31.0	36.1	
96	44	10	2	1	21.6	5.6	33.0	38.6	
126	36	0	1	14	19.2	8.6	30.0	38.6	
53	45	10	2	1¼	21.8	1.3	33.25	34.55	
45	42	8	1	6½	30.2	.5	22.5	23.0	
10	60	12	1	15½	31.1	nil	31.25	31.25	
86	73	0	2	2¾	33.6	4.6	34.75	39.35	
54	69	8	1	11¾	40.0	1.4	27.75	29.15	
67	72	14	2	7¼	29.7	2.7	39.25	41.95	
59	65	10	1	0¾	62.6	1.9	16.75	18.65	
57	50	4	1	4¼	59.7	1.7	20.25	21.95	
156	40	0	2	5½	20.5	11.6	37.50	49.1	
88	39	0	1	11	23.1	4.8	27.0	31.8	
136	45	14	2	6½	19.0	9.6	38.5	48.1	
147	29	12	1	12½	23.3	10.7	28.5	39.2	
39	27	12	1	4	22.2	nil	20.0	20.0	
81	44	0	2	6	18.5	4.1	38.0	42.1	
43	60	12	3	4	18.6	.3	52.0	52.3	
161	68	4	1	12½	39.9	12.0	28.75	40.75	
163	57	4	1	13½	31.3	12.0	29.25	41.25	

Special Prize, £5, given by British Friesian Cattle Society.—379, with 41.95 Points.

Special Prize, £5, given by Red Poll Cattle Society.—461, with 49.1 Points.

Special Prize, £5, given by English Guernsey Cattle Society.—606, with 42.1 Points.

102 *Report on the Society's Dairy Department at Taunton.*

morning, 4th day of the Show. The churning was commenced about 7 a.m., and finished soon after 10 a.m., all the creams were churned at a temperature of 54 degrees.

The tables on pages 100-101 give the Results.

Average Results for each Class are as follows :—

CLASS 136.		<i>Breed.</i>	<i>No.</i>	<i>Days in Milk.</i>	<i>Milk.</i>	<i>Milk Ratio</i> <i>Butter. to lb. Butter.</i>	
					lbs. ozs.		
	Jersey	11	94.63	40	12	1.15	21.07
CLASS 137.							
	Devon	5	76.0	43	15½	1.15½	22.24
	Shorthorn ..	5	69.0	61	½	2.1½	30.1
	British Friesian	5	80.0	63	1½	1.10½	40.66
	Guernsey ..	3	89.	37	2½	1.12½	20.0
	Jersey	1	136.	45	14	2.6½	90.0
	South Devon	1	53.	45	10	2.1½	21.5
	Red Poll ..	1	156.	48	0	2.5	20.5
	Aryshire ..	1	88.	39	0	1.11	23.1

The First Prize Winner, Mr. Musgrave's Shorthorn Dairymaid 1st with 3lbs. 4ozs. butter and Ratio of 18.6 established a record in the Butter Tests of this Society.

It is interesting to note that Mr. Musgrave attributed no small part of his success to the fact that for the previous six months he had been systematically feeding his Stock on the lines recommended to him by the Director of the Farm Institute, Cannington.

These Tests are an object lesson to the public of the danger of trusting to the Defence, of an "Appeal to the Cow," in cases where sellers of milk are prosecuted for supplying milk below the standard, and are also an argument in favour of the prohibition of milk, containing less than 3% B.F. being sold as "milk."

SALES OF PRODUCE DEPARTMENT.

"The Pavilion" had been much improved and made more convenient without any appreciable extra cost; there was an abundant supply of milk, and as in former years, junkets, soft cheeses, cream and butter were on offer to Visitors to the Show. There was not, however, nearly such a good demand for dairy produce as we found at Swansea, partly on account of the cooler weather, and partly due to our being in a district well supplied with such produce. The whole of the milk and butter was, however, disposed of at the close of the Show. and the prize Cheddar Cheese realised a satisfactory price.

MILKING COMPETITIONS.

The cows for these competitions were kindly provided by Mr. S. Northcote and the competitions were carried out at his dairy at Sherford, situated about half-a-mile from the Show-yard. There were three classes : Class 255 for men 16 years and over, for which there were 7 entries ; Class 256 for women 16 years and over, for which 5 entered : and in the last Class 257, for boys and girls under 16, only one boy entered.

The Judge, Mr. J. Macintosh, National Institute for Research in Dairying, near Reading, gave the Competitors some valuable advice as to the proper method of milking, laying great stress on the importance of dry milking, and his remarks were very much appreciated.

My thanks are due to Miss Saker and her Staff for their valuable assistance in the "Working Dairy" ; to Captain Clive and Mr. Read, who spared neither time nor trouble in taking charge of the Produce Department ; and to Mr. G. N. Rawlence, who with Capt. Clive, assisted me in the Tests and also had the supervision of the Milking Competitions : and to Mr. Kerr for both lending the Society the Gerber Tester and also making the Tests entirely free of any charge.

CLEAN MILK DEMONSTRATIONS.

These Demonstrations were conducted by Mr. Wm. A. Hoy, University College, Reading, and Miss M. C. Taylor, who was assisted by Miss P. M. G. Tucker, both ladies being on the Staff of the Cannington Farm Institute, Mr. Peters, Taunton, kindly lent two fine Shorthorn Cows which were kept in the Shed while the Show was open.

On the first day two Demonstrations were given at 11 a.m. and 2.30 p.m., and on the three following days there were three Demonstrations, 11 a.m., 2.30 p.m., and 5 p.m., and on the last day two, 12 a.m. and 2.30. p.m.

The proper method for milking : the handling of the milk from cowshed to consumer, which included bottling the milk and sterilizing all the plant, and the necessity of absolute cleanliness, were all dealt with. The use of the covered pail was demonstrated and it was obvious to the onlookers that this was one of the most important steps in bringing about the production of "Clean Milk." These pails were on Show at Mr. Tyler's (Highbridge) Stand near the Working Dairy. It was shown that the production of clean milk is the foundation stone of successful Dairying in the West. This refers quite as much to the products of milk, *i.e.*, cheese, butter, etc.,

as to milk in its liquid condition. It was also shown that the equipment for the production of clean milk¹ is simple and capable of being installed at every dairy farm. These demonstrations were well attended, created a good deal of interest, and justify their repetition at subsequent Shows of the Society.

The thanks of the Society are due to the National Institute for Research in Dairying for allowing Mr. Hoy to give these Demonstrations, and to Mr. Hoy, Miss Taylor and Miss Tucker for the part they took in giving them.

It may be mentioned that the Somerset Agricultural Committee showed their appreciation of the value of these Demonstrations by making a grant of £25 to the Society towards the cost.

X.—FORESTRY AT TAUNTON, 1924.

By G. Lipscomb, Steward.

The Exhibits in the Forestry Section at Taunton were quite up to the average, both in quality and quantity, and there was little duplication. In dealing with such an industry as Forestry it is not easy to bring much variety within the four walls of the Annual Exhibition, but it is always interesting, and the encouraging fact that emerges from these forestry sections at the various Agricultural Shows is that there is a distinct and maintained revival of interest in forestry matters and, as the exhibits go to prove, a fairly general advance in practice. The Forestry Commission has been a live force in this connection and a real help to all those dealing with forestry matters. At Taunton the Commission Exhibit was again under the care of Captain Popert and was carefully prepared and well staged; the exhibits forming a complete history of tree life. The Charborough Park Collection met with much appreciation and the medal of the English Arboricultural Society and the certificate of Merit of the Bath and West were awarded to this exceptionally good exhibit sent by Captain Erle-Drax and—as in previous years—under the charge of Mr. Munro, his Forester, who has taken so much pride in maintaining this collection at a very high level. The English Forestry Association were not able to send a general exhibit this year, but contributed a model of a West Country tract of upland—the slopes of Exmoor—planted with seedlings of the actual trees appropriate to the exposure, soil and altitude. Sitka on the moist ground at the foot of the slope—larch in the

intermediate positions and Scotch and Corsican on the high ground. The model called forth criticism and discussion and was much appreciated. Mr. Luttrell, of Dunster Castle, sent some very fine planks of brown oak, also ordinary oak and a few other woods of excellent quality—the brown oak being particularly admired.

The Great Western Railway in their exhibit again pointed to the fact that good English timber is fully suitable for many railway purposes, from the creosoted sleepers of elm, oak, Scotch larch and beech, taken from their running lines, to a beautiful door of brown oak of first rate quality. The Hon. Mrs. Smyth sent from Long Ashton a large number of Estate fittings, doors, window frames, etc., made from timber grown on the Long Ashton Estate and worked up in the Estate yard—proving how entirely suitable home grown timber is for this purpose. It is satisfactory to find an increasing number of Estates working up their own timber for repairs and also for constructional work. With the Long Ashton Exhibit, which as usual was well staged, were some interesting specimens of creosoted timber, showing penetration, and a table giving the result of creosoting green timber; a loss of weight being the almost invariable result after treating in hot creosote.

Mr. Sherrin contributed a small exhibit of willows for basket-making—the quality of some being exceptionally good, and pointing to the paying nature of this crop, where suitable land exists for its cultivation; though the idea held by some people that willows can be cultivated satisfactorily on any odd marshy corner where the water is stagnant, is entirely incorrect. Messrs. Constance and Sons, of Long Hope, contributed a very complete collection of articles made by them from home grown timber, of which they use some twenty varieties at their works, and the output includes handles for axes, brooms, hay rakes and forks, hammers, etc., and all instruments in fact that require a shaft. A most complete and interesting collection well staged and fully described.

The demonstration enclosure as usual was popular, and Mr. Turner, the Somerset County Horticultural Superintendent (whose services the County Council had kindly placed at the disposal of the Society), gave excellent talks on pruning, budding of fruit trees, reversion of black currants and on other matters connected with fruit trees, to keen and interested audiences.

Mr. H. A. Pritchard again kindly officiated as judge of the Section and the thanks of the Society are due to him.

XI.—AGRICULTURAL EDUCATION AND RESEARCH, NATURE STUDY AND HANDICRAFTS.

By H. M. Cundall, I.S.O., F.S.A.

AGRICULTURAL EDUCATION AND RESEARCH.

The exhibit under the main title of Agricultural Education and Research was arranged jointly by the University of Bristol and the Somerset County Council. This arrangement, which is a new one, worked admirably. It not only avoided unnecessary duplication of exhibits when both the Advisory Officers attached to the University and the Agricultural staff of the County Council are undertaking similar lines of work, but it very much facilitated explanations of the exhibits to farmers interested.

In the Agricultural Section the excellent series of grassland turves showing work on grassland improvement carried out in Somerset was augmented by the inclusion of a few turves from other parts of the Province served by Bristol University. These turves showed wide variation in types of grass land and remarkable improvements on very rough, poor grazing land. Especially interesting was a set of turves illustrating work on grass land improvement being carried out in conjunction with the Bath and West and Southern Counties Society.

Samples of the herbage from more modern types of Seeds Mixtures, as well as examples of clover plants used in such mixtures, were shown.

An exhibit on *Liming* included typical pieces of land taken from fields showing the characteristic weeds and crop failures of land short of lime. The materials used for liming were classified and shown in a way which brought out the relationship of one form of lime to another. The importance of fineness of grinding in the case of samples of carbonate of lime (such as ground limestone) was shown by comparing an original sample of ground limestone with a similar sample divided into two portions, that which passed through a fine sieve and that which did not. The phosphatic fertilisers used most commonly in the improvement of grass land were also shown side by side in a way in which they could be compared.

The importance of obtaining definite information from analytical data was shown in the case of basic slags and ground mineral phosphates. The difficulty of judging the quality of a slag or of ground mineral phosphate simply by appearance and "feel" was illustrated. The last point was especially well brought out in the case of the fineness of a sample of ground mineral phosphate.

The advisory work of the SOMERSET FARM INSTITUTE at Cannington is concerned with the cultivation and treatment of crops, and the improvement of grass land, the purchase and use of artificial manures and feeding stuffs, the treatment of insect pests and fungoid diseases of farm and garden crops, the cultivation and management of fruit trees, the marketing of fruit, the making of cheese and butter, poultry management, and all matters pertaining to agriculture, horticulture, dairying and poultry keeping in the County. To demonstrate this work the Farm Institute contributed an interesting series of exhibits in the Dairy and Horticultural Sections in addition to those in the Agricultural Section.

In the Dairy Section there were varieties of cheeses, a number of them showing the influence of the quality of the milk in the yield of cheese, and types of milk, pasteurized, sterilised, sweet and raw milk. A number of daily dirt pads demonstrated that the personality of the cowman is greatly responsible for the production of clean milk. An interesting chart showed the relative value of milk sold wholesale, retail, as cheeses and as butter. The various rations for poultry, and the correct manner in which to truss them for table were also exhibited.

In the Horticultural Section there was a model to illustrate a secure and economical way of tying orchard trees when staking, and a collection of prepared grafts collected in the county to show three types of grafts useful for working farm orchard trees.

- (a) Crown or Bark method for old trees.
- (b) The Somerset Saddle, useful for wood up to $1\frac{1}{2}$ ins. diameter.
- (c) Tongue or Whip Graft, useful for small wood such as weak branches and "brood wood."

Also shown were specimens of grafts—

- (a) Made and united three weeks previous to the show.
- (b) Cut in such a manner which may not lead to successful work.
- (c) Showing an older method known as cleft grafting. Specimens showing frequent failures, excepting in the hands of the expert.
- (d) Ill fitted and dead, and diseased owing to dirty hands and tools.

There was also a sample of useful grafting wax made of four parts resin, two parts beeswax, one part tallow.

Mounted shoots, showing the development of fruit bearing wood in apples, from one year up to six years were exhibited. These had

a bearing on pruning and were shown to help visitors to realise that when a branch begins to fruit it is induced to fruit more regularly, whereas, if such a shoot is severely pruned, rank growth may be the result.

Specimens of apples, "Allington Pippin" grown on five trees grafted on different types of stocks were also shown. The variations in the fruit were such as to have some green, others small and others very large and well coloured. They illustrated the importance of having trees grafted upon standardised types of stocks.

Prepared cards showed sprays applied by various types of nozzles for different types of fluid, *e.g.*, for winter washes, fungicides, etc.

In a section devoted to plant-pests and diseases were included examples showing Leaf Roll or Leaf Curl of Potatoes, and also Mosaic disease of Potatoes; strawberry plants affected by eelworm, producing the "Red Plant" disease as compared with normal plants; and black currant bushes, affected by Reversion disease with mounted leaves and instructions as to the identification of diseased bushes.

BRISTOL UNIVERSITY, in addition to the joint exhibit of grass turves and other specimens with the Somerset Farm Institute in the Agricultural Section, was represented by the following Departments.

From the Department of Zoology there were shown spirit specimens demonstrating the development of various domestic animals, and their diseases; also specimens of animal parasites and pests.

The Department of Geology contributed specimens showing sources of phosphates; phosphatized limestone and fossil bones, both from America and rheatic and Cambridge Greensand remains from this country; a series of specimens illustrating weathering in various rocks; a series of photographs illustrating weathering of acid and basic igneous rocks, and soils formed in various limestone and sandstone areas; also a set of diagrams showing water supply and pollution.

The Agricultural and Horticultural Research Station of the University contributed the comprehensive exhibit demonstrating the results of some of the numerous researches in progress at Long Ashton. In addition to the specimen turves taken from poor pastures under treatment for improvement and the eradication of bracken, in connection with the Society's experiments on this subject, there were striking specimens of various kinds of fruit trees and bushes, strawberries and potatoes, showing the effects of deficiencies of the respective essential food elements

in those plants. A series of photographs illustrated the manner in which fruit trees from new roots after planting out, which in the case of freely rooting shoots such as the Paradise forms of apple rootstocks practically amounts to the production of an entirely new root system. In the section of the exhibit devoted to plant pests and diseases the results of the most recent investigations on Reversion disease of black currants were demonstrated. That section also included examples of many insect and fungoid diseases of agricultural, horticultural and fruit crops with information as to the treatment for control recommended and in some instances with specimens of the spray fluids advised for use. The advantages of using "spreaders" to assist the covering properties of these fluids were shown in a graphic form. The work of the Station on the culture and utilisation of willows was illustrated by a collection of a large number of varieties and species of willows growing in pots, specimens of diseases and pests of the willow, forms of willow rods suitable for specified purposes, bye-products and other points of interest pertaining to the willow-growing and basket-making industries.

The Campden Fruit and Vegetable Preservation Research Station of the University contributed an attractive exhibit, showing many methods of preserving different kinds of fruits and vegetables and special products such as fruit juices, pickles, chutneys, etc.

NATURE STUDY AND HANDICRAFTS.

This Department of the Society's Show was fairly up to the average of former exhibitions. It was composed of the work done in the schools under the educational committees of the counties of Somerset and Dorset, and of the borough of Taunton. With regard to nature study it appears this æsthetic subject is gradually being somewhat superseded by the more practical work of school gardening, whilst handicrafts are now being generally introduced into the school curriculum. The collective exhibit from twenty-one schools in Somerset was systematically arranged and displayed good work in the various sections. Many of the specimens in wood work, with constructive drawings, showed excellent teaching. They comprised scientific apparatus and gardening appliances, besides objects of general utility, including a dog-kennel, a bee-hive, milking stools and egg boxes. There were drawings correlated with school gardens, and illustrations of a definite scheme of the study of plant and insect life, carefully executed. From the Domestic Subjects Centres there were shown cakes, biscuits and jams: also

a school-girl's lunch and a labourer's lunch, compactly fitted into small cases, so as to be easily carried.

The exhibit from the Dorset Education Committee comprised general class work illustrative of co-ordinated and progressive schemes. It consisted of essays and illustrated note books on nature study, gardening, needlework and housewifery, art work in pencil and colour, freehand and memory drawing, scale and mathematical drawing, diagrams and charts. Handwork included woodwork, cardboard, raffia, paper and plasticine models, and toy-making by infants. Needlework consisted of examples of stitchery by infants and garments by older pupils.

The Taunton Borough Education Committee contributed a collection of work executed principally in Infant and Elementary Schools comprising drawings and models of plants and flowers, linoleum and wood-printing blocks and raffia work. From the North Town Handicraft Centre there were some models carefully executed, whilst from the North Town Domestic Subjects Centre there were displayed bottled fruits, jams, jellies and dried herbs. The Central Girls' School contributed various examples of needlework. The Somerset County Federation of Women's Institutes at Minehead exhibited various handicrafts made by members.

The writer begs to tender his best thanks to all the officials of the various institutions for the assistance they so readily gave him in connection with the arrangement of the exhibit, on and with the preparation of the report upon it.

XII.—THE EXHIBITION OF CIDER AT TAUNTON.

By Major E. W. Farwell, Steward.

The entries at the Taunton Exhibition in 1924 numbered 50, as compared with 56 at Swansea in 1923 and 28 at Plymouth in 1922.

The classes, as usual, were open to growers or makers, and were on the same lines as at previous Shows, with the addition of a class for exhibitors who had never taken a first prize before.

The entries in the several classes were as follows :—

Cider made in 1923.

Entries.

CLASS 230.—Cask of cider by an exhibitor who has not previously taken a first prize at any public exhibition

5

CLASS 231.—Cask of cider, specific gravity not exceeding 1.015 at 60° Fahr.	<i>Entries.</i> 5
CLASS 232.—12 Bottles of cider ditto	6
CLASS 233.—Cask of cider	12
CLASS 234.—12 Bottles of cider Cider made previous to 1923	13
CLASS 235.—12 Bottles of cider.	9
	— 50

Samples from each exhibit were submitted to Dr. J. A. Voelcker, M.A., F.I.C., for analysis and particulars of the result are set out in the accompanying table, together with the Specific Gravity of the Juice as supplied by the exhibitors. No entries were absent and none were disqualified.

Mr. A. T. Price, of Blackhall, Berkeley, Gloucestershire, was the Judge appointed by the Society and he carried out his duties on the first day of the Show.

The Novice class was sufficiently well supported and the quality of the cider was so creditable that the Society's step in instituting it was justified. Its continuation depends upon the amount of support it receives.

The class for dry cider in cask gave the Judge some difficulty in placing the entries in their proper order of merit. the cider being of very even quality and much alike in colour. The first prize went to a cider made of 75 per cent. Tom Tanners and 25 per cent. Cap of Liberty.

In the bottle class for dry cider there was only one good cider, all the others being of moderate quality. Kingston Black formed 75 per cent. of the prize winning cider, the remainder being Cap of Liberty.

The Open classes for cider in cask and in bottle were both well filled and those which received awards were of very even quality though widely different in colour and aroma.

In Class 233 the winning cider was made of Tom Tanners and the second cider of Kingston Black, while in Class 234 both first and second prize ciders were made of mixed fruit.

The best cider in the Exhibition was found in the last class and here the awards were easily placed as the ciders showed more individual character than any cider of the 1923 vintage.

The first prize was given for a cider made of Royal and White Jersey, Dove, and Cap of Liberty.

RESULTS OF ANALYSIS.

No.	Specific Gravity.	Solids.	Percentage of Alcohol.	Acid.	Sp. Gr. of Juice as given by Exhibitor.
1	1.000	1.95	6.08	.57	
2	1.017	5.55	4.25	.20	1.054
3	1.002	2.71	6.86	.30	
4	1.006	4.05	8.31	.32	
5	1.031	8.50	2.82	.43	1.060
6	1.014	5.00	5.38	.40	1.054
7	1.015	5.10	4.95	.42	1.057
8	1.006	2.95	4.44	.28	1.055
9	1.015	5.17	3.67	.35	1.059
10	1.015	5.00	4.40	.38	1.058
11	1.013	4.80	5.40	.30	1.054
12	1.012	4.70	5.58	.30	1.057
13	1.007	3.10	4.54	.25	1.055
14	1.015	5.00	4.20	.40	1.059
15	1.015	5.40	4.13	.38	1.058
16	1.011	4.20	5.03	.33	
17	1.024	7.10	4.10	.45	1.054
18	1.028	7.85	3.67	.47	1.056
19	1.006	4.00	8.40	.30	
20	1.032	8.36	1.91	.38	
21	1.011	3.95	4.39	.35	1.052
22	1.020	5.76	3.38	.40	1.059
23	1.022	6.60	4.20	.47	1.057
24	1.023	7.10	5.23	.43	
25	1.025	7.10	3.96	.42	
26	1.018	5.57	4.25	.30	
27	1.028	7.70	2.96	.48	1.058
28	1.025	7.10	3.53	.53	1.056
29	1.031	8.45	3.10	.73	1.058
30	1.028	7.80	3.81	.60	1.054
31	1.030	8.30	3.50	.45	1.056
32	1.012	5.30	7.20	.30	
33	1.035	9.00	2.00	.35	
34	1.010	3.70	4.37	.25	1.052
35	1.028	8.00	3.84	.53	1.059
36	1.020	5.90	3.65	.37	1.057
37	1.026	7.30	3.70	.43	
38	1.024	7.00	4.10	.48	
39	1.017	5.47	3.98	.32	
40	1.030	8.20	2.91	.38	1.061
41	1.008	3.30	4.39	.40	1.056
42	1.027	7.30	2.89	.30	1.057
43	1.013	5.40	7.10	.33	
44	1.017	5.20	3.45	.27	1.060
45	1.020	5.30	1.73	.43	
46	1.018	5.40	3.76	.33	1.057
47	1.026	7.00	2.25	.32	1.058
48	1.028	7.50	2.77	.48	
49	1.030	7.80	2.22	.42	

Generally speaking, the 1923 classes were difficult to judge, principally because none of them were of outstanding merit, no doubt due to the poor season.

The following are the Judge's (Mr. A. T. Price) comments on the exhibits :—

BLACKHALL,

BERKELEY, GLOS. ;

June 24th, 1924.

The Cider Classes at the Bath and West Show, Taunton, produced a very fine show on the whole, some very good, a few indifferent and not a bad lot anywhere ; and as far as I was able to judge and I think I should or ought to have detected it, they were a very clean lot of unadulterated ciders

The 1923 ciders as a rule were nothing very outstanding, but the most quite good, but it was in Class 235, No. 42, that I came to something that stood head and shoulders above all the old cider typical of Somerset, fairly dry, no acidity, very fruity and smooth. I think one of the best ciders I ever sampled.

The first Class, No. 230, was a Novice class, in cask, made in 1923. This class is a new class and I believe it will do a great deal of good, for many young makers are afraid to show against veterans, but this will give them courage to persevere. There were five entries, one quite good and the other four very fair, taking the class as a whole, very useful.

Classes 231-234 were all in good condition and on the whole very good and some even really excellent. Taking it on the whole 1923 was a fair year for cider but it was not a vintage year.

Class 235, 12 Qt. Bottles, previous to 1923. It was in this class that stood the outstanding cider of the Show ; good condition, good colour, no acidity, very fruity, and after you had got a taste of it there was a desire to try it again. It was as an old friend of mine told me once over a similar judging, that it was a most seductive drink.

XIII.—SMALL HOLDINGS COMPETITION.*By E. Pritchard.*

Having been appointed to judge the competition for the best managed Small Holdings, held in connection with the Bath and West Society's Meeting at Taunton, I have to report as follows :—

The Competition was limited to ex-Service Small Holders farming under the Somerset County Council.

CLASS I. SMALL HOLDINGS OF OVER 15 ACRES.

Eighteen entries were received.

My Awards are as follows :—

Entry No. 10.

FIRST PRIZE :—S. G. Nash, Fideoak Farm, Bishops Hull, Taunton, 50 acres.

Entry No. 13.

SECOND PRIZE :—R. H. Shire, Down Farm, Donyatt Estate, Ilminster, 51 acres.

Entry No. 16.

THIRD PRIZE :—E. H. Vincent, Thrupe Farm, Croscombe, 51 acres.

Entry No. 12.

FOURTH PRIZE :—H. R. Rossiter, Pinckney Farm, Kingston, 50½ acres.

Entry No. 8.

SPECIAL PRIZE :—S. Kimber, Bazelands Hill, Henstridge, 20 acres.

Entry No. 9.

RESERVE AND HIGHLY COMMENDED :—H. S. Mitchell, Sea Farm, Donyatt, Ilminster, 52 acres.

Entry No. 18.

HIGHLY COMMENDED :—J. W. White, Hillside Farm, Martock, 60 acres.

Entry No. 10. The Holding, occupied by this tenant, who secured First Prize, included 27 acres of Pasture and 23 acres of arable. The Stock, which was of high standard and in good condition, consisted of :—13 cows, 1 calf, 3 horses, 2 store pigs, 1 sow, and 50 head of poultry.

The arable land was in sound heart, the crops were free from weeds and well above the average.

The fences, banks and ditches were in proper order.

The buildings, yards and surroundings were particularly clean, full use was made of the garden, and generally, the Holding presented a well cared for and thriving appearance.

Entry No. 13. Comprised 32 acres of pasture and orchard and 18 acres of arable. The Stock was as follows :— 10 cows, 1 bull, 1 in-calf heifer, 4 yearlings, 5 calves, 7 sows, 58 slip pigs and 70 poultry.

The Holding was well farmed and narrowly missed gaining the First award.

Entry No. 16. This Holding, which is situated on the Mendip Hills, included 45 acres of pasture and 5 acres of arable. The Stock consisted of :—13 cows, 2 yearlings, 4 calves, 2 horses and 75 head of poultry.

The Holding was in good order, particularly in view of the character and situation of the land.

Entry No. 12. Consisted of 27 acres of pasture and 23 acres of arable. It carried the following Stock :—7 cows, 2 horses, 4 two-year old in calf heifers, 1 barren heifer, 4 weaning calves, 1 steer, 10 store pigs and 40 head of poultry. This stock was well up to the average.

The arable land was very clean and farmed on sound lines. The tenant showed considerable enterprise in the cropping and the crops looked promising.

This entry would have received a higher Award had it not been for the neglected state of the buildings and yards.

Entry No. 8. Special Prize. This entry comprised a " Bare land " Holding of 20 acres of pasture. The stock consisted of :—9 cows, all of useful type. The pasture was in good heart and the fences and ditches were in highly satisfactory condition.

Looking to the fact that the tenant was under a great disadvantage in having no buildings, the Holding fully deserves the award of a Special Prize.

GENERAL REMARKS.

Out of eighteen entries in this class I was favourably impressed by the standard of farming shown by the large majority of the entrants and by the number and type of stock kept upon the Holdings. The cows were, for the most part, of a particularly useful quality.

The farming of the arable land, especially in the Taunton, Ilminster and Martock districts, reflected great credit upon the tenants, but in certain other areas the men are handicapped by their arable land, which is wet lying and heavy working.

A more enterprising method of cropping would be advantageous in one or two classes.

The progress made with the fences and ditches was generally satisfactory, but there is still room for improvement in certain instances.

Looking to the fact that the men depend very largely for their livelihood upon the production of milk, I should have liked to have seen the buildings and yards of some of the competitors brought up to the high standard of cleanliness set by the winners of the first three prizes.

CLASS 2. SMALL HOLDINGS OF OVER 2 ACRES, BUT NOT MORE THAN 15 ACRES.

Entry No. 5.

FIRST PRIZE :—E. A. Wilkins, Fideoak Farm, Bishops Hull.
5 acres.

Entry No. 2.

SECOND PRIZE :—E. Gillingham, Court Farm, Seavington,
Ilminster, 8½ acres.

Entry No. 4.

THIRD PRIZE :—A. R. Tobias, Staplegrove, Taunton, 2½ acres.

Entry No. 3.

HIGHLY COMMENDED :—W. J. Miller, the Post Office, Locking,
10 acres.

Entry No. 5. Comprises a cottage with 3 acres of arable land and 2 acres of orcharding. The arable area, which three years ago formed part of a large farm, and had not previously been used for intensive cultivation, has now been converted into a highly productive Nursery and Market Garden.

The tenant, who retails his produce in Taunton, has provided his own glass, and has shown great enterprise and skill in his method of cropping the land.

A pony and 60 head of poultry form the stock.

The garden attached to the cottage is in excellent order and the holding is conducted on productive lines.

Entry No. 2. Comprised a cottage, one acre of orcharding, and 7½ acres of arable land, now used for Market Garden purposes. While this area is not worked on such intensive lines as in the case of the winner of the First Award, the various crops were in a thriving condition and the land was clean and in good heart.

The stock consisted of 1 horse, 1 sow, 1 slip pig, 2 goats, and 78 head of very useful poultry.

The tenant, who owns a Ford motor lorry, disposes of most of his produce in Weymouth, 40 miles away.

Entry No. 4. This holding forms one of a group of six cottage holdings, comprising a cottage, $1\frac{1}{4}$ acres of arable and 1 acre of pasture. The arable is intensively cultivated as a Market Garden, and the crops look healthy and are free from weeds.

The Stock consists of 1 pony, 1 breeding sow, and 230 head of poultry.

The tenant has shown skill and ingenuity in his method of keeping such a large head of poultry on so small an area. The holding generally is pleasing and has a well kept appearance.

GENERAL REMARKS.

The outstanding feature in this Class, is the hard work and enterprise shown by the winners of the three prizes, in converting ordinary farm arable into practically self-supporting Market Garden holdings, in a comparatively short space of time.

Not only does the cropping and general management of the holdings reflect great credit upon the men, but their method of disposing of the produce, in an already crowded market, speaks well for their business capabilities.

They are, however, somewhat handicapped by the difficulty in obtaining a sufficient supply of manure at a reasonable cost.

The remaining entries in the Class consist of small "bare land" grass holdings.

I may add that I found the tenants in both classes to be in a contented and optimistic frame of mind, and if present prices are maintained, they felt confident of their ability to continue the success which they have already achieved.

XIV.--ANNUAL REPORT UPON THE SOCIETY'S GENERAL OPERATIONS.

By F. H. Storr.

The Annual General Meeting of Members was held on Thursday, May 29th, in the Council Pavilion in the Show Yard at Taunton.

The President, Sir Dennis F. Boles, Bart., C.B.E., D.L., was in the Chair, and among the members present were The Marquis of Bath, K.G., Lord Bledisloe, K.B.E., and Messrs. H. B. Napier and R. Neville Grenville (Vice-Presidents), Lord Swansea, D.S.O., M.V.O., Sir F. H. Bathurst, Bart., D.S.O., Sir F. B. Beauchamp,

Bart., Lt.-Col. Sir C. Miles, Bart., Col. F. S. W. Cornwallis, Col. E. Lewis, Col. R. A. Moore-Stevens, Maj. E. W. Farwell, Maj. F. H. T. Jervoise, Capt. W. Best, Capt. E. A. B. Clive, Capt. The Hon. T. H. Watson, Rev. A. T. Boscawen, Prof. J. Penberthy, Messrs. G. E. Lloyd Baker, E. Clatworthy, H. M. Cundall, I.S.O., F.S.A., J. E. Daw, R. J. Denning, C. L. Fox, E. S. Fursdon, J. T. Gibson, G. Gifford, S. J. Knight, G. Lipscomb, W. D. McCreath, G. Nichols, F. J. Parker, J. Pope, E. A. Rawlence, J. F. Shelley, A. F. Somerville, T. E. Studly, G. Symons, P. C. M. Veitch and J. Williams.

The Minutes of the last General Meeting having been read and confirmed on the motion of the Marquis of Bath, seconded by Lord Swansea, it was unanimously resolved that Lt-Col. F. S. W. Cornwallis be elected President of the Society for the ensuing year.

On the motion of Mr. H. B. Napier, seconded by Capt. E. A. B. Clive, it was resolved that Sir Dennis F. Boles, Bart., C.B.E., Lord Wynford, D.S.O., Mr. H. M. Cundall, I.S.O., F.S.A., Mr. A. F. Somerville and Mr. C. C. Tudway be elected Vice-Presidents of the Society, and the gentlemen named on p. cxviii of the appendix were elected members of the Council for the years 1924-1926 on the motion of Mr. F. J. Parker, seconded by Col. E. Lewis.

Lord Bledisloe in moving the adoption of the following report, which had been passed by the Council Meeting on the previous day, remarked that though the Society was the oldest of the great Agricultural Societies of England, yet it was not the least progressive. It was not merely a show holding society, a large amount of work being performed outside the Show yard. He ventured to prophecy that in days to come all great Societies would be judged as much by this criterion as by the shows they had held. No part of the Show yard was deserving of greater attention than that devoted to the educational buildings, and in visiting Somerset they had come to a county which could be congratulated on its efforts to teach children to use their hands and minds in an intelligent manner. The adoption of the report, seconded by Mr. E. A. Rawlence, was approved, and the report was ordered to be printed in the Society's Journal.

The Council, in presenting their Annual Report, congratulate the Members upon visiting once more such an important agricultural centre as Taunton, after a lapse of twenty-nine years. Somerset being the home county of the Society, it is a matter of especial congratulation that the meeting has resulted in such a thoroughly representative exhibition. The disastrous epidemic of Foot and Mouth disease which has swept over the country for the last eight months made it doubtful until a very recent date whether stock

entries could be received, but fortunately the situation has improved once more with the coming of summer. The Society owes a special debt of gratitude to the Somerset County Council for the consideration shown to them in this respect, and, indeed, to all County Councils who have facilitated the movement of stock to Taunton.

The exhibition is a large one, and indeed, if all stock entries could have been sent, would have constituted something approaching to a record in this department. For the first time Ayrshire cattle are represented in the classification, and will have to stand comparison with the English Dairy breeds. The space taken for implements is considerably in excess of that occupied last year and will fully tax the resources of the excellent site provided by the Taunton local committee. More space has been devoted to Agricultural Education and Research than at any other show in the kingdom, the Society, as it has always done, recognising the great importance of this section of the show, and supplementing it by a series of lectures and demonstrations covering a wide variety of subjects. This would not be possible without the whole hearted assistance given by the colleges and County Authorities, and the thanks of the Society are especially due to Bristol University and Research Station and to the Taunton, Somerset and Dorset Education Committees, and the Somerset Agricultural Committee in this connection. The Council have also particular pleasure in acknowledging the friendly co-operation of the Somerset County Agricultural Association, who have suspended their show for the year, and of the Taunton Local Committee, who have devoted a great deal of hard work and enthusiasm towards making the Show a success.

The Society's research work on the Improvement of Poor Pastures has been continued with a view to clearing up some points which need special elucidation. The chief of them is the determination of the effect of acidity of soil upon the benefits derived from artificial manures, particularly phosphatic manures. This is an important point which may only admit of regional determination, as it may prove to be dependent on such influences as rainfall and soil constituents. A further series of plots has been secured which will be devoted to this branch of the subject. The work so far undertaken has shown that in many cases pastures can be cleared of bracken and improved by the application of manures at a cost which will bring a good return to the farmer.

The Live Stock Defence Committee, which has had the support of the Society, has done useful work before the Railway Commission by ensuring adequate representation for the views of agriculturists, and in many instances was able to secure amendments to the schedule

of railway charges which will benefit farmers and breeders. The position with regard to the imposition of entertainment tax on Agricultural Shows has also been improved so far as to allow of band performances, though the Commissioners of Customs still exercise a vigilant control over all exhibits. On the other hand H.M. Inspector of Taxes has reversed the practice of many years by questioning the status of Agricultural Societies as legal charities, on the ground that there is nothing in the constitution of the Society to prevent a distribution of its funds among the members. It is proposed to take Counsel's opinion on this point. A demand has been received for the payment of income tax on Show profits, and will no doubt be followed by a further demand for the tax on investments and on members' subscriptions. It may be necessary to try to secure support for Parliamentary action against this policy, which would impose an unfair burden on societies whose sole object is the public benefit.

In response to continued requests the Council instructed the Secretary to call a meeting of Show Secretaries with a view to the formation of a permanent association, which would meet to discuss matters of common interest and importance. Two meetings have been held and a number of resolutions have been submitted to the councils of the Show Societies in the kingdom, most of which have met with approval. It is thought that an Association of Show Secretaries, so long as it is recognised as a purely advisory body, may serve a useful purpose, and be of considerable benefit, especially to the smaller societies. Another matter which has been engaging the attention of the Council is the shortage of competent judges on the panels of some of the breed societies. Your Council are of opinion that it would be highly undesirable to admit probationer judges to the judging ring, but that the Society should be prepared to consider any other steps the breed societies may suggest to facilitate the training of probationers.

Members of the Society will have already received details as to the very successful meeting at Swansea in 1923. The record attendance of over 115,000 people and the diminution of the necessary expenses have enabled the Council to vote a larger sum to this year's show, and to invest £4,747 16s. in 3½ per cent. Conversion Loan. Grants were made to the Swansea General and Eye Hospital, to the South Wales Branch of the St. John's Ambulance Association, and to the Swansea Branch of the Y.M.C.A. There has again been a slight appreciation in the present value of the Society's invested capital. The membership of the Society shows an increase, but the Council feeling that the Society's work was not yet widely

enough known, decided to issue a special booklet in connection with the present meeting, which it is hoped will reach the hands of prospective members. The Council much regret to have to report the death of Mr. C. L. F. Edwards, Trustee and Vice-President of the Society, and for over thirty years an active steward of the yard. The Society never had a more devoted and popular servant, nor one whose absence will be more deeply felt, while as president of the mess he did much to add to the popularity of the annual meetings.

The Society has also lost two Vice-Presidents, the Duke of Somerset, and the Earl of Jersey, and a Member of Council, Mr. H. Bridgeman. Extraordinary vacancies on the Council have been filled by the appointment of the Hon. N. A. Orde-Powlett, Col. F. S. W. Cornwallis and Col. W. O. Gibbs.

During the year the Council have continued their grant to the Bristol University Agricultural Research Station, which has given the Society invaluable help in the conduct of its field demonstrations, and has now undertaken the scientific control of the additional plots above referred to, in spite of an ever increasing burden of work. The extent and variety of the activities undertaken by the research station can be judged from the report printed in the Society's Journal. The representation of the Society is unchanged on the governing bodies of the Bristol University Research Station, the R.A.C. Cirencester, the Dauntsey School Foundation, Wye College and the Sugar Beet Growers' Society.

The Council have pleasure in reporting that Col. F. S. W. Cornwallis has agreed to be nominated as President for the ensuing year. They recommend that Lord Wynford, Mr. H. M. Cundall, Mr. A. F. Somerville and Mr. C. C. Tudway be elected Vice-Presidents of the Society as a recognition of their long services as stewards and members of Council. They also recommend that the gentlemen named on the agenda paper be elected as Members of Council for the years 1924-26.

Your Council desire to express to Lieut.-Col. Sir Dennis F. Boles their sincere thanks for his services as President of the Society during the past year, and for his unfailing help towards the success of the Taunton meeting. They recommend that he be elected a Vice-President of the Society.

Votes of thanks were passed to the Mayor of Taunton, to the Local Committee, and to the Judges.

On the motion of Capt. W. Best, seconded by Col. R. A. Moore-Stevens, the thanks of the Society were tendered to the G.W.R. Co.

for the excellent arrangements made for transport in connection with the Show.

On the motion of Mr. H. B. Napier, seconded by Lord Bledisloe, it was resolved that the Secretary be instructed to express to the Devon County Association the regret of the Society at the losses sustained by the Association at their Newton Abbot meeting. The Secretary was further to state that this meeting was prepared to recommend to the Council of the Society that a grant of £100 be made to meet the expected deficit, if the County Association needed financial assistance.

NATIONAL FRUIT AND CIDER INSTITUTE.

ANNUAL CIDER TASTING DAY.

Arrangements are being made for the annual Cider Tasting Day for 1925 during the first week in May—Thursday, May 7th—and it is also proposed to hold an autumn Field Day during September. Due notice of the date of this latter function will be given through the Press.

In addition to the above a number of “Open Days” are being arranged for the coming season. On these occasions the plantations will be open to the Public to inspect certain special features of the work of the Station which are showing particular points of interest on these occasions. Notice of these days will also be given through the Press and it is hoped that parties of growers and the fruit-growing public will avail themselves of these opportunities of inspecting the work of the Station. It is hoped to arrange these days at intervals of approximately one month throughout the growing season.

Arrangements are also being made to give special attention to visitors on Wednesday of each week throughout the season and it is hoped that those proposing to visit the Station will endeavour to do so on those days so that excessive calls on the time of the Staff may be avoided.

XV.—THE NATIONAL FRUIT AND CIDER INSTITUTE.

By B. T. P. Barker, M.A., Director.

In reporting on the work of the Institute for 1923 it was pointed out that for the first time since the outbreak of the war it had been possible to proceed under relatively stable and settled conditions. While in most respects these conditions have been maintained during 1924 the abnormal number of staff changes which have occurred has made continuity in certain directions of research difficult and in a few instances a definite break—temporary only, it is hoped—has resulted. The development of the work generally is taking a natural course, limited only in its increase by the extent of staff and money available. Each of the major problems upon which the Station is engaged is constantly opening up fresh avenues which require to be explored and the fact must be faced that the rate of progress in future will undoubtedly be dominantly determined by the resources at disposal. Results of practical significance are already foreshadowed in many lines of work and it needs only the necessary means to secure them.

The additions to the Station in the shape of buildings, land and equipment referred to in the two last Annual Reports, the cost of which has been largely met by a capital grant from the Ministry of Agriculture, are now practically complete. Further information on these will be found below in the sections on Land and Buildings.

Staff.—The post of Plant Physiologist left vacant by the departure of Mr. F. Summers has been filled by the appointment of Mr. C. E. T. Mann, M.Sc., who was previously on the staff of the Botanical Department of University College, Reading. The Institute is greatly indebted to Professor V. H. Blackman, M.A., F.R.S., for advice and assistance which he has very kindly undertaken in connection with the work on this subject.

Mr. E. Ballard, B.A., who was appointed as Adviser in Economic Entomology as recently as the last academic year, accepted the offer of an important entomological appointment under the Cotton Research Association in Australia and left the service of the Station at the end of January, 1924. For the summer months the duties of this post were temporarily undertaken by Mr. L. N. Staniland, A.R.C.S., whose services were secured for that period by arrangement with Professor H. M. Lefroy, D.Sc., of the Imperial College of Science, London, to whom the thanks of the Station are due for releasing him from his post as assistant in his Department. Mr. Staniland has subsequently been given the appointment vacated by Mr. Ballard.

At the end of April, 1924, Mr. G. S. Peren vacated his appointment as Pomologist to the Station to take up that of Sir John Buchanan Professor of Agriculture at Victoria University, Wellington, New Zealand. In view of the increase of work attached to this post at Long Ashton, it was decided to fill the vacancy by making two distinct appointments and dividing the duties, which had hitherto been of a dual character. Mr. E. Ball, B.A., has been given the post of Research Pomologist and will be concerned exclusively with the research and experimental side of the subject. Mr. J. G. Maynard, B.A., has been placed in charge of the cultural side of the field work at the Station and will serve as Practical Pomologist. Both received their earlier training at Cambridge University, Mr. Ball subsequently proceeding to research work at the East Malling Fruit Research Station and Mr. Maynard, after a period of work on fruit storage research under the Food Investigation Board of the Department of Scientific and Industrial Research, taking up practical fruit culture in Norfolk. Since in neither case could the appointment take effect until the latter part of the summer there was an important period of the season when this section of the work of the Station had to be maintained by other members of the Staff in addition to their normal duties. As a result, progress in certain investigations has been necessarily delayed somewhat.

The loss to the Station by the departure of Messrs. Ballard and Peren within a few months of each other has been particularly unfortunate in respect of the investigation on the "Red Plant" disease of strawberries for which they were jointly responsible. Arrangements have been made for continuing the work, but the progress which it had been hoped to make in 1924 has been retarded.

Mr. J. F. Ward, B.A., completed his investigation of the root systems of red and black currants at the end of May and has now left the Station to take up work in connection with the East Anglian section of the Fruit Soils' Survey.

The Advisory staff has been strengthened by the addition of Mr. R. M. Nattrass, B.Sc., who has been appointed to the newly created post of Advisory Mycologist. Mr. Nattrass commenced his duties in February, 1924.

In addition to these staff changes a very important alteration has been made concerning the administrative side of the work of the Station. Since the war the activity of Bristol University in the direction of agriculture and horticulture has rapidly increased and a definite Department of Agriculture and Horticulture, including the various branches of research and advisory work, has been

established. The taking over of the Campden Fruit and Vegetable Preservation Research Station and the appointment of Dr. J. A. Hanley as Agricultural Information Officer a year ago have opened up new fields of work. These, together with the quick growth of the research and advisory sides at Long Ashton and the development of close association with various outside bodies, have made the provision of assistance in the direction of the affairs of the Department necessary. The general charge of work under the Advisory Scheme has therefore been placed in the hands of Dr. Hanley, as Chief Advisory Officer. Mr. Appleyard, the senior member of the research staff at Campden, now serves there as Resident Director also, and Mr. T. Wallace, hitherto Advisory Chemist at Long Ashton, has been transferred from the Advisory to the Research Staff of the latter Station to act as Deputy Director. Professor Barker, the Head of the Department, will in future have their assistance in the administration of the work in the various directions indicated.

Land and Plantations.—Under this head there is little which calls for special mention. It was reported a year ago that some 20 acres of land, under grass until that time, had been drained and ploughed in preparation for new plots of fruit. The preliminary cleaning and cropping with agricultural crops is proceeding and it is expected that a portion will be fit for planting during the course of the next twelve months. The remainder it is intended to plant in the autumn of 1926.

On part of the land previously prepared plots of strawberries for manurial experiments have been established as planned. A further small area of the same fruit has also been planted up for the continuation of other lines of investigation already in hand. In this connection it should be stated that the programme of strawberry investigations in the field unfortunately has had to be considerably modified. There were two reasons for this. In most of the plots where cultural and other related trials were in progress a seriously large percentage of the plants during the course of the summer showed signs of being affected with eelworm and other forms of pathological trouble, the nature of which is at present obscure. There is some reason to believe that the continuous wet and cold weather was responsible for the abnormal rate of spread of disease. It being evident that crop records from these would be entirely misleading, the work on them has been abandoned and the plots mostly grubbed. The second reason leading to the abandonment of some of the plots was the weakening of the plants during the summer by excessive weed growth. During the period of cropping

in June and July cleaning could not be carried on owing to interference with the crop records and as a result under the wet conditions the plots became badly overgrown with weeds. It has been decided in view of the experience now gained that it is necessary first to concentrate research on the pathological aspect of strawberry culture, since reliable results from cultural experiments will be difficult to secure until adequate measures of control of diseases and pests are discovered. Most members of the research staff are now occupied with various problems in the latter connection in the hope of solving quickly the question of control of strawberry diseases, so that the original lines of work may be resumed with as little delay as possible.

A supply of water has now been carried to the part of the farm occupied by the plantations established since the war and this will serve both for the new buildings and stabling and for spraying purposes.

Buildings.—During the year the outstanding schemes for additions to the buildings of the Station referred to in the last Report have been practically completed.

The much needed insectory and shelter for outdoor pot experiments were finished in time to be put in use for the past season and have been found of great service.

The erection of the extension of the orchard house has been deferred, since the recently added accommodation under glass has proved sufficient for immediate needs.

This has permitted of sufficient funds being available to carry out the library extension mentioned a year ago and to add another small office.

The new wing of the cider house has been in regular use. By the relief which it has afforded to the congestion in the main building it has been possible to carry on the cider work under much more satisfactory conditions. The provision of equipment for washing the fruit and for pasteurisation of the expressed juice is being found of great service.

General.—The Fruit Soils' Survey, now entering its third season, has progressed considerably during the year. The information so far gained has thrown much valuable light on the question of success or failure of the fruit plantations in the areas surveyed.

Educational exhibits have been sent during the year to the Imperial Fruit Show, the Bath and West and Southern Counties Society's Show, and the Wilts County Show. An exhibit was also sent to Worcester for the Three Counties Show, which was abandoned at the last moment owing to the flooding of the Show ground.

The Station was represented in the Government Pavilion at the British Empire Exhibition at Wembley, having contributed a section to the comprehensive exhibit organised by the Ministry of Agriculture and Fisheries to illustrate the work of the agricultural and horticultural research stations of Great Britain.

A well attended Field Day was held at the Station on July 15th, 1924. The Institute was also visited during the season by nineteen organised parties and a large number of individual visitors.

Close touch is being maintained with the Botley Experimental Fruit Station. The work there has been closely associated with that at Long Ashton and duplicate trials on such subjects as the manuring of strawberries and strain selection are in progress at both centres.

During the year the first steps towards the provision of local instruction in cider making in the Western Counties generally have been taken. In pre-war days occasional instruction was given in one or two of the counties by part-time instructors employed by the County Councils; since the war very little has been done. The recent rapid growth in popularity of cider as a beverage has resulted in increased attention and interest on the part of farmers in both farm orcharding and cider making, with a corresponding desire for information as to modern methods of making. The Institute in conjunction with the Ministry of Agriculture and the County Councils of the West of England has considered the possibility of organising a joint scheme of local instruction to cover the whole area and a definite proposal has now been laid before the local authorities. There appears to be sufficient promise of financial assistance from them in view to justify the expectation that the scheme may be in operation for next cider-making season. As a preliminary step the Institute placed the services of Mr. Grove at the disposal of contributing counties for the major part of the 1924 season for local lectures and demonstrations in the subject. While this course necessarily involved some curtailment of the programme of experimental work in the cider-house and laboratory at Long Ashton, it has more than justified itself in demonstrating the extent of the call for local instruction and the lines on which such instruction should in future be based.

For some time the Ministry of Agriculture and the Meteorological Office have had under consideration the question of obtaining data on the nature of the correlation between weather conditions and the behaviour of crops. A scheme has now been agreed upon, to be carried out at certain research stations and other institutions in various parts of the country, by means of which a large volume of facts designed to throw valuable light on the subject should be

secured. At each centre certain test crops will be grown for a period of years and a wide series of meteorological observations taken to cover the whole of that time. The Long Ashton Station is participating in this scheme, which is now in operation, the test crops in this case being certain kinds of fruits and vegetables.

The following articles, contributed by the members of the staff whose names are attached, contain accounts of the advisory work of the year and the progress in some of the recent investigations at Long Ashton. There are in addition many other problems under examination, which will be reported on in due course as results justify.

ADVISORY WORK.

During the year the scope of the advisory work carried out at this centre has been further extended by the appointment of Dr. J. A. Hanley as Agricultural Information Officer. He now serves as Chief Advisory Officer. A preliminary report on his work is included.

By the appointment of an Adviser in Mycology it has also been possible to deal more thoroughly than hitherto with advisory problems in this subject. Although the officer only took up his duties on February 18th, it will be seen from his report that since that time he has been very fully occupied in the province.

There is a further small increase over previous years in the number of enquiries received and there is every reason to believe that the work of the centre will be maintained in future years.

The Advisory officers have worked very closely in conjunction with the various County Organisers of the Province during the year and many experiments are being carried out jointly by the Advisory Centre and the various County Authorities.

The statistics of enquiries for the past five years are given in the following table, which shows also the numbers received from each of the counties comprising the Bristol Province.

						Year ending Sept. 30th.				
						1920	1921	1922	1923	1924
Gloucester (including Bristol) .. ..	..	..	..	..	..	53	73	78	136	137
Hereford .. .. .	..	..	..	..	..	10	22	21	62	107
Somerset .. .. .	..	..	..	..	..	79	96	114	141	130
Wiltshire .. .. .	..	..	..	..	..	3	10	18	66	24
Worcester .. .. .	..	..	..	..	..	29	45	46	48	78
Other Areas .. .. .	..	..	..	..	..	117	125	201	205	195
						291	371	478	658	671

Included in the figures under " other areas " are enquiries received from Devon and Monmouth, both of which counties contribute annual grants to the Long Ashton Institute, although not forming part of the Bristol Province.

The figures given have reference only to enquiries dealt with by correspondence. Much advisory work is not recorded by them, since a large amount of advice is given to farmers and growers visiting the Station or on the occasions when advisory officers visit farms in the course of making tours of various areas in the Province.

As regards the subjects of enquiry, these show a steady increase under all heads with the exception of fruit products, which shows a decrease. Actually there has not been any marked decrease in the advisory activities under this latter head, as might be suggested by the figures for the past two years, as in this department much verbal advice is given, enquirers often preferring to visit the Station to talk over matters with the officer rather than deal with certain aspects of the work by letter. In addition most of the enquiries in this subject other than those relating to cider making are now dealt with by the Campden Station, the work of which is not included in this Report.

The reports of the Advisers in Economic Mycology and Economic Entomology still indicate that farmers do not utilise the advisory facilities provided in these subjects by the Advisory Scheme to as great advantage as they might do. Such advice is, however, eagerly sought after by fruit growers.

The enquiries relating to willows and to fruit and vegetable preservation are not included in the above statistics.

A separate report on the former work by the advisory officer in that subject is appended, while the latter are dealt with in the report of the Campden Station.

NATURE OF ENQUIRIES.

Fruit Products (including Cider-Making.)

The enquiries received through the post, viz., 152, represent only a portion of the work dealt with under this head. The most important part has been covered in the course of personal interviews at the Research Station and visits to orchards and cider-making premises, on which occasions there has frequently been opportunity

for practical demonstrations touching upon the points of enquiry. The written enquiries were distributed as follows :—

Gloucester	..	..	..	..	..	..	24
Hereford..	..	..	..	..	..	..	14
Somerset..	..	..	..	..	..	..	29
Wiltshire..	..	..	..	..	..	..	1
Worcester	..	..	..	..	..	..	9
Other Areas	..	..	..	..	..	..	75
							<hr/> 152

Included in the above are several enquiries received from the following countries outside Great Britain :—Ireland, Canada, East Africa, South Africa, New Zealand, France and Denmark.

The questions raised cover practically the whole field of cider and perry making. They have referred to the characters of cider fruit, vintage varieties recommended for propagation ; cider orchards, cider-making appliances, equipment and methods of manufacture ; the storage, preservation and bottling of the finished product ; its composition ; various bacterial and other disorders ; the action of various preservatives ; and by-products, such as cider vinegar and dried pomace. Among particular subjects treated there may be mentioned the establishment, equipment and general working methods of a cider factory, the financial aspect of cider-making, the use of culinary and dessert varieties of apples for vintage purposes, the characters of French cider varieties and French ciders, the physiological effects of cider, and the action of that beverage on metals.

Other matters under this head which have been dealt with are the production of concentrated fruit juices and methods of clearing extracts of apple pulp and fruit juices.

Pomological.

The 91 written enquiries under this head originated as follows :—

Gloucester	..	..	..	..	..	..	18
Hereford..	..	..	..	..	..	..	5
Somerset..	..	..	..	..	..	..	12
Wiltshire..	..	..	..	..	..	..	0
Worcester	..	..	..	..	..	..	14
Other Areas	..	..	..	..	..	..	42
							<hr/> 91

As in all other sections of the advisory work, the figures give an inadequate idea of the total amount actually dealt with, so much being done by personal interviews with visitors to the Station and

growers on their own farms. They also relate only to enquiries which are primarily pomological in character; the numerous cases concerned with definitely pathological aspects of fruit culture are included in the mycological and entomological sections of this Report.

Few, if any, of the questions involved presented novel features or call for special comment. A relatively large number related to strawberry culture and their nature clearly indicated the pressing need for investigations on "red plant" and other abnormal and possibly related forms of growth which are now being undertaken at the Station. The other conspicuous feature among the enquiries has been the frequency of cases largely attributable to bad weather conditions during the growing season, such as failure of blossoming trees to produce crops.

The following five sections, dealing with Agricultural Chemistry, Economic Entomology, Economic Mycology, Agriculture and Willow Culture, have been respectively contributed by Mr. T. Wallace, Mr. L. N. Staniland, Mr. R. M. Nattrass, Dr. J. A. Hanley and Mr. H. P. Hutchinson, the Advisers in those subjects.

AGRICULTURAL CHEMISTRY.

The number of requests for advice received during the year was 173. The sources and nature of these enquiries, together with their special points of interest, are given below :—

SOURCES OF ENQUIRIES.

Gloucester	..	..	..	..	..	43
Hereford..	..	..	..	..	..	58
Somerset..	..	..	..	..	..	41
Wiltshire..	..	..	..	..	..	7
Worcester	..	..	..	..	..	13
Other Areas	..	..	..	..	..	11
Total	..	..	..	..	..	173

NATURE OF ENQUIRIES.

(1) *Soil Problems.*

(a) *Soil Manurial Problems.*

Pastures and Meadows	..	..	..	..	..	43
Arable Soils	..	..	..	..	..	160
Fruit Soils	..	..	..	..	..	20
Hopyard Soils	..	..	..	..	..	10
Market Garden and Nursery Soils	..	..	..	..	..	2
Garden Soils	..	..	..	..	..	3
Total	..	..	..	..	..	238

(b) Miscellaneous Soil Problems.

Soil Conditions causing Chlorosis of Fruit Trees	..	7
.. .. in cases of Leaf Scorch of Fruit Trees	..	13
.. .. " failures of Fruit Crops	..	9
.. .. " failures of Hops	..	3
.. .. " failures of Agricultural Crops	..	26
Suitability of Soils for Fruit Growing	..	11
.. .. " Cucumber Growing	..	1
Total	..	70

(2) Miscellaneous Enquiries.

Agricultural value of samples of Lime Materials	..	9
Potash content of samples of Wood Ashes	..	1
Manurial value of sample of Town Refuse Manure	..	1
.. .. " Glassworks Refuse	..	1
.. .. " Sewage Sludge	..	2
.. .. " Waste Bone material	..	1
.. .. " liquid effluent from waste fruit heap	..	1
.. .. " Leather waste	..	1
.. .. " "Grass" manure	..	1
.. .. " "Hop" manure	..	1
.. .. " treated Soda Ash	..	1
.. .. " Soot	..	1
.. .. of samples of Fertiliser damaged by floods	..	2
General enquiries on Manuring of Fruit Trees	..	5
.. .. " .. " Agricultural Crops	..	3
Fineness of grinding of samples of Basic Slag	..	1
The mixing of various Fertilisers	..	1
Composition of samples of Lawn Sand	..	1
The use of potash manures against Leaf Scorch	..	1
Manurial treatment against "Stripe" in Tomatoes	..	1
Analyses of samples of Feeding Stuffs	..	2
Total	..	38

Number of Samples examined in dealing with Enquiries.

Soils	..	323
Lime materials	..	9
Miscellaneous samples	..	29
Total	..	361

Number of farms visited in dealing with Enquiries 54

OBSERVATIONS ON ENQUIRIES.

The number of enquiries submitted to the Department showed a further increase over that of last year. The proportion of the enquiries received from the several counties of the Province was fairly similar to that of last year with the exceptions that there was a large increase in number from Herefordshire and a large decrease from Wiltshire. The large increase in numbers from Herefordshire was to a great extent due to the fact that the Agricultural Organiser has encouraged farmers in that county to submit soil samples for examination from fields in which he suspected poor cropping to be due to acid conditions, whilst the fall in the number from Wiltshire was due to the fact that the number received in the previous year was abnormally high owing to many of the samples examined during that year having been submitted as the result of a special campaign which was conducted in parts of the county by the County Organiser on the subject of "the liming of Greensand soils."

With regard to the nature of the enquiries dealt with, it will be noted from the figures given that these were almost wholly related to soil problems and fertilisers.

(1) Soil Enquiries.

The general nature of the soil enquiries was similar to that of previous years. The largest proportion of these related to the cropping of arable soils and in the majority of such cases it was found that where difficulties in cropping were experienced the soils were deficit in lime.

The more interesting cases of this type of enquiry were those from the Bunter Sandstone districts in Gloucestershire and Worcestershire where, owing to the wet nature of the season preventing the working of root crops in the early stages, spurrey grew so vigorously that it completely smothered the young plants.

Some liming trials are being arranged on some of the worst fields examined in these areas.

A number of instances of soil acidity associated with poor cropping on some of the deeper Oolite soils on the Cotswold Hills were investigated during the season. Such examples are of importance as acid soil conditions are not generally suspected on these soils.

Other important cases examined were in connection with poor cropping on heavy calcareous soils derived from the Lower Lias formation, on brashy Oolite soils and on intractable clays from the Fullers' Earth formation.

Enquiries submitted on the subject of pasture improvement generally related to the desirability of using various forms of phosphatic fertilisers for this purpose. An interesting case was observed at Sevenhampton, Gloucestershire, on a meadow, the soil of which was a heavy Lias clay in which the herbage was in very poor condition, which showed no improvement from phosphatic manuring, but which responded markedly to a dressing of kainit. The meadow had previously been "hayed" for many years.

Many of the enquiries relating to Fruit Soils have provided matter for detailed investigation and some of the problems which they raised will be investigated during the course of the next season or so.

Further cases of "Leaf Scorch" and Chlorosis of fruit trees were examined and these have furnished useful data for investigations on these problems now in progress at this Research Station.

Three cases of failures of hops were reported from Hereford and in two of these cases the failures were found to be due to "hard pan" and one to the peculiar close textured silty nature of the soil. The roots of the hops in the former two cases were waterlogged during the period of heavy rains and the foliage during the whole of the season remained yellow.

(2) *Miscellaneous Enquiries.*

There were no special points of interest in connection with these enquiries.

SPECIAL INVESTIGATIONS IN PROGRESS DURING THE SEASON.

(1) *Field Experiments on "The Eradication of Bracken from Poor Moorland Pastures."*

These experiments were continued in conjunction with the Experiments Committee of the Bath and West and Southern Counties Agricultural Society.

(2) *Field Experiments on "The Improvement of Poor Pastures where the Soils are Acid in Reaction."*

Experiments were laid down at nine centres in the Province. At these centres various phosphatic fertilisers and lime are being tested,—in conjunction with the Experiments Committee of the Bath and West and Southern Counties Agricultural Society.

(3) *Field Experiments as under on "The Manuring of Fruit Trees in Plantations and Grass Orchards."*

- (a) Effect of dung and potash manures on Leaf Scorch (experiments continued)—in conjunction with the County

Organiser for Worcester, the Horticultural Superintendent for Somerset, the Horticultural Instructor for Hereford and various fruit growers.

- (b) The effect of phosphatic manures in a case where deficiency in phosphoric acid is indicated (experiments continued)—in conjunction with the Agricultural Organiser for Worcestershire.
- (c) The effect of autumn and spring dressings of nitrogen on apple trees (experiments continued)—in conjunction with County Organiser for Worcestershire.
- (d) The effect of dressings of phosphatic and potassic manures on apple trees in grass orchards (experiments continued)—in conjunction with Agricultural Organiser for Gloucestershire.

(4) *Field Experiments on "The Effect of Spraying with Sulphate of Iron on Chlorosis of Apple Trees."*

These experiments were continued in conjunction with the Horticultural Superintendent for Somerset.

(5) *Experiments on "Liming of Arable Soils."*

These experiments were continued under the scheme of the Ministry of Agriculture and Fisheries.

Centres where experiments are in progress :—

Hereford	..	..	..	..	..	..	4 centres
Gloucester	..	..	..	..	..	..	1 centre
Worcester	..	..	..	..	..	..	1 „

Further centres were selected for experiments under this scheme as under :—

Gloucester	..	..	..	..	..	..	2 centres
Worcester	..	..	..	..	..	..	1 centre

(6) *Survey of Fruit Soils on the Old Red Sandstone Formation in the West Midlands.*

Continued—under the Scheme of the Ministry of Agriculture and Fisheries.

Work was continued in the laboratory on the soil samples collected from the areas under survey.

ECONOMIC ENTOMOLOGY.

Though the report here given is for the whole year, the present Advisory Entomologist only took up his duties on May 9th, 1924.

The number of letters of enquiry dealt with during the year was 113, of which only four were of an agricultural nature, the remainder all dealing with fruit. The enquiries dealt with were as follows :—

Gloucester	..	..	..	..	..	..	18
Hereford..	..	..	..	..	..	..	14
Somerset..	..	..	..	..	..	..	14
Wiltshire..	..	..	..	..	..	..	4
Worcester	..	..	..	..	..	..	24
Other Counties	..	..	..	..	..	..	39
Total..	..	..	..	..	..	..	113

This number shows an increase of 33 enquiries on last year. Of the total number of enquiries, 25 were dealt with by the present Adviser, the remainder receiving attention prior to his appointment.

In addition to advice sent by letter, in answer to enquiries, much information has been given in connection with 64 advisory visits made during the year by the present Adviser. In addition to these a number of visits were made by the other Advisers earlier in the year.

The following is a list of the pests, classified under host plants, which have been serious during the period under review.

Host Plants.	Pests.	Remarks.
Apple	Capsid bugs (<i>Plesiocoris rugicollis</i>)	Fairly general, but particularly in Gloucester, Hereford and Worcester
"	Apple Sawfly (<i>Hoplocampa testudinea</i>)	
"	Caterpillars, including Winter Moth, Tortrix larvae, etc.	Serious in places but unevenly distributed
"	Apple Blossom Weevil (<i>Anthonomus pomorum</i>)	In some cases up to 80% of the blossom was "capped"
Plum	Plum Aphid (<i>Anuraphis pruni</i>)	
"	Plum Sawfly (<i>Hoplocampa fulvicornis</i>)	Bad in the Evesham district and in parts of Hereford and Gloucester
Black Currant	Capsid bugs (<i>Psallus</i> sp.)	Some bad cases in Evesham dist.
"	Aphids	
Raspberry and Loganberry	Logan Beetle (<i>Byturus tomentosus</i>)	Particularly in Evesham district
Gooseberry	Gooseberry Sawfly	
Strawberry	Earworm attacks	"Cauliflower" in Hereford. "Red Plant" general. "Patch" at Evesham and Long Ashton
Mangold	Mangold fly (<i>Pegomya betæ</i>)	Severe in Somerset
"	Slugs	Severe in Wiltshire

The advisory letters sent during the year have dealt principally with the following questions, in addition to the list set out above :—

Host Plants.	Pests.
Apple	Wood Leopard Moth (<i>Zeuzera pyrina</i>) Ichneumon cocoons
Apple and Pear ..	November Moth (<i>Oporabia dilutata</i>) Apple and Pear Leaf Blister Moth (<i>Ornix petiolella</i>) Caterpillars of various kinds.
Cherry	Sawfly (unidentified)
Plum	Mites (<i>Oribata lapidaria</i>) (beneficial)
Vine	Mealy Bugs
Walnut	Leaf Gall Mite (<i>Eriophyes tristriatus</i> , var. <i>erineus</i>)
Strawberry ..	White Fly Leaf Hoppers
Oak	Spangle Galls (caused by <i>Neuroterus baccarum</i>)
Raspberry ..	Saw flies (unidentified)
Tomatoes ..	Leaf Hoppers
Teazel	Aphids (<i>Macrosiphum rosae</i>)
"Cudweed" ..	An enquiry as to whether an aphid (<i>Pemphigus sp.</i>) present was Woolly Aphis or not.

Much advice has been given concerning winter egg-killing washes, particularly the Carbolineum fluids, and in connection with black currant pests.

INVESTIGATIONS IN PROGRESS.

Work is being carried out in collaboration with the Research Entomologist, on the "Red Plant" disease of strawberries. An investigation is also being pursued in connection with a fly doing damage to Teazels in Somerset. A field experiment was carried out, by kind permission of a grower in the Evesham district, in order to test the effect of a reduction of the number of sprayings with Lead Arsenate against the Logan Beetle (*Byturus tomentosus*). Bad weather conditions made the carrying out of the experiment difficult and doubtless caused the spraying to be less effective than it might have been. Arsenate paste was tried against Arsenate powder and the latter was found to be the more effective. A casein spreader was used in each case. A difference of 4% only in favour of the treated bushes was found between the untreated control and the area sprayed with arsenate powder; this difference was found by counting the number of berries in equal weights from the two areas.

ECONOMIC MYCOLOGY.

Prior to the present Adviser taking up duty on February 18th, 20 enquiries had been received by the Mycological Department. These enquiries were dealt with by the Research Mycologist.

Sources of Enquiries.

The total number of enquiries dealt with during the past year and their sources are given below :—

Gloucester	..	..	..	..	..	..	34
Hereford—	..	..	..	..	..	..	16
Somerset..	..	..	..	..	..	..	34
Wiltshire..	..	..	..	..	..	..	12
Worcester	..	..	..	..	..	..	18
Other Counties	..	..	..	..	..	..	28
Total	..	..	..	..	..	..	142
Visits paid to farmers and growers during the period under review	..	..	..	..	..	..	88

General Observations on Enquiries.

The season has been notable for the epidemic occurrence of several diseases—in part due to its abnormally wet character. Of these the more important were as under :

(1) *Chocolate Spot*. One of the earliest of these outbreaks was that of Chocolate Spot of field beans. Enquiries were received from each of the five counties, particularly severe cases being reported from the Severn Valley.

A series of field trials and pot experiments are being carried out in collaboration with the Agricultural Organiser for Gloucester, the object being to test the value of potash dressings and seed sterilization, and also to ascertain to what extent the disease is carried on in the soil.

(2) *Ring Spot of Lettuce*. The Ring Spot Disease of lettuce (*Marssonina panattoniana*), a hitherto comparatively uncommon disease in this country, appeared fairly extensively in Gloucestershire and Wiltshire.

(3) *Black Scab*. The Black Scab of apples and pears (*Venturia inæqualis* and *pirina*) was very prevalent. It was the worst attack for many years.

(4) *Potato Blight*. The potato Blight (*Phytophthora infestans*) was widespread and serious throughout the province, particularly in Somerset.

(5) *Currant Leaf Spot*. An epidemic attack of the Currant Leaf Spot (*Pseudopeziza ribis*) occurred on nearly all plantations of black currants. The attack was followed in many cases by the

Currant Rust (*Cronartium ribicola*). The two diseases were frequently confused—damage done by the former being attributed to the latter.

(6) *Plum Diseases*. Many enquiries were received dealing with diseases of plum trees.

(a) *Silver Leaf*. There is evidence that "Silver Leaf" is on the increase, particularly among Victorias. A few cases have been noted on Egg Plums. Some growers are attempting to control the disease by the practice of "ringing" and by the use of a proprietary article "Silver Stop," but so far no conclusive results have been obtained.

(b) "*Die-Back*." The "Die-Back" of stone fruits caused by *Diaporthe perniciosa* has resulted in the loss of many trees in the five counties. Observations made bear out the point, which is being emphasised by the Research Mycologist in work shortly to be published, that the invasion by *Diaporthe perniciosa* follows some serious physiological disturbance brought about by unsuitable conditions, such as bad drainage, injury to roots and stem by implements, and indiscriminate and bad pruning. Pruning snags and chafing wounds by the stake form a ready means of entry to the fungus. Prevention of these two, in addition to keeping the tree as strong and healthy as possible, is indicated as being the means of controlling the disease.

(c) *Leaf "Shot-Hole"*. A disease causing leaf "shot-holes" and lesions on the stems of young nursery plum stock was sent in for diagnosis. An unidentified bacterial organism was found to be associated with, and is probably the cause of, the disease.

(7) *Fruit Rot of Pears*. A fruit rot of pears was submitted for diagnosis. The fungus isolated is being investigated in collaboration with the Research Mycologist.

List of Subjects of Enquiry.

The following list indicates the nature of the majority of the enquiries received during the year:—

Host Plant.	Nature of Disease.	Casual Organism.
APPLE	Black Scab	<i>Venturia inaequalis</i>
	Canker	<i>Nectria galligena</i>
	Mildew	<i>Podosphaera leucotricha</i>
	Leaf Spot	<i>Physiological (?)</i>

Host Plant.	Nature of Disease.	Casual Organism.
PEAR	Black Scab	<i>Venturia pirina</i>
	Rust	<i>Gymnosporangium sabinae</i>
PLUM.. ..	Silver Leaf	<i>Stereum purpureum</i>
	"Die-Back"	<i>Diaporthe pernicioza</i>
	Root Rot	<i>Armillaria mellea</i>
	Wither Tip	<i>Monilia cinerea</i>
	Brown Rot	<i>Monilia fructigena</i>
PEACH	Leaf Curl	<i>Eozascus deformans</i>
	"Die-Back" and Fruit Rot..	<i>Diaporthe pernicioza</i>
CHERRY	Wither Tip	<i>Monilia cinerea</i>
GOOSEBERRY ..	American Gooseberry Mildew	<i>Sphaerotheca mors-uvæ</i>
BLACK CURRANT ..	Leaf Spot	<i>Pseudopeziza ribis</i>
	Rust	<i>Cronartium ribicola</i>
	Silver Leaf	<i>Stereum purpureum</i>
MANGOLD	Violet Root Rot	<i>Rhizoctonia violacea</i>
BEAN	Chocolate Spot	<i>Bacillus lathyri</i>
PEA	Root Rot	<i>Thielavia basicola.</i>
WHEAT	"Take all"	<i>Ophiobolus graminis.</i>
POTATO	Late Blight	<i>Phytophthora infestans</i>
	Dry Rot	<i>Fusarium caeruleum</i>
CLOVER	"Sickness"	<i>Sclerotinia trifoliorum</i>
LUCERNE	Leaf Spot	<i>Pseudopeziza medicaginis</i>
CELERY	Leaf Spot	<i>Septoria apii</i>
LETTUCE	"Ring Spot"	<i>Marssonina panattoniana</i>
ONION	White Rot	<i>Sclerotium cepivorum</i>
	Mildew	<i>Peronospora Schleideni</i>
SALSIFY	White Rust	<i>Cystopus tragopogonis</i>
TOMATO	Canker	<i>Diplodina lycopersici</i>
	Stripe	<i>Bacillus lathyri</i>
	Stem disease	<i>Sclerotinia</i> sp.

AGRICULTURE.

This section of the Advisory work began with the establishment of the Bristol Centre in April, 1924.

Since then the Adviser has been almost fully occupied with grassland work for the Ministry and it has not been possible, therefore, to develop advisory work in the Bristol Province extensively yet.

A certain amount of work has been carried out in the Province, chiefly in connection with problems relating to temporary and permanent grassland.

One interesting innovation in county work on agricultural education in Herefordshire should be mentioned in this connection. The Agricultural Adviser was called in, together with a prominent farmer of the district, to judge grassland recently laid down, and from their experiences to draw up a judges' report for the guidance not merely of future competitors, but also of any farmer who contemplates laying down land to grass. There were thirty entries and the prominence given to this competition will undoubtedly draw the attention of many farmers to the value of adopting suitable

seeds mixture and good methods of cultivation, etc., when sowing land down to grass. Advice has also been given on Down land in Wiltshire and on grassland in Somerset and Gloucestershire.

WILLOW CULTURE AND THE UTILIZATION OF WILLOWS.

The total number of enquiries answered by letter during the year was 92, distributed as follows :—

Gloucester	..	..	..	..	..	..	12
Hereford..	..	..	..	..	..	..	0
Somerset ..	..	..	..	..	..	..	9
Wiltshire..	..	..	..	..	..	..	0
Worcester	..	..	..	..	..	..	4
Other Areas	..	..	..	..	..	..	67
Total	..	..	..	..	..	..	92

As in previous years the enquiries were mostly concerned with :—

- (1) Suitability of different types of land for the Basket willow crop and the cultivation of willow varieties for different basket-making purposes.
- (2) Method of preparing land for the crop.
- (3) The planting of Tree Willows, chiefly the Cricket-bat Willow.

Special advice was given to prospective willow growers in Canada, Natal, Australia, New Zealand, Tasmania and India. A consignment of willow sets comprising twenty-two varieties was despatched at the request of the Department of Agriculture for New Zealand for trial experiments in that country. Similar consignments of sets were sent to settlers in New Zealand and to a native willow grower in Kashmir, India.

Insect and Fungus Pests.

The summer of 1924 proved favourable to the growth of the willow crop and damage due to insect and fungus attacks has been less than in previous years.

Field experiments on the control of Beetle attacks were devised and carried out in Somerset in collaboration with Mr. A. H. Lees, Entomologist at this Station, but no results of economic value were obtained owing to the crops being only slightly attacked.

A Lancashire willow grower reported a severe attack of *Physo-pora gregaria* on the varieties "Violets" and "Mawdsleys." Specimens were sent to Mr. G. H. Pethybridge, Pathological Laboratory, Harpenden, for fuller investigation.

Cricket-Bat Willow Culture.

Twelve enquiries were received. The advice given was in connection with :—

Methods of production of sets suitable for planting as trees.

Suitability of land and the obtaining of sets.

The growing of Cricket-bat willows under sewage farm conditions. A case was brought to the notice of the Adviser where 50 Cricket-bat trees, growing on a sewage farm in Somerset, had been sold for £550. The age of these trees was 20 years from the time of planting.

Land Inspection.

Four inspections of land for willow culture were made in Somerset, Pembroke and Worcester, and advice given on drainage, planting and general management of the willow crop.

Exhibits.

Exhibits of willows and willow products were shown at the Bath and West and Southern Counties Show, at Taunton, and at the British Empire Exhibition, Wembley.

The exhibit at Taunton consisted of growing plants of the chief commercial varieties of willows, dyed willow rods, and rods buffed by a new method.

The uses which might be made of willow bark were demonstrated.

Many enquiries were answered during the Show week.

A public address on "The Value of the Willow as a Means of Utilising Wet Land" was given at the Bath and West and Southern Counties Show, Taunton, and an article entitled "The Buffing of Willows" was published in the Journal of the Bath and West and Southern Counties Society.

*POT EXPERIMENTS ON THE MANURING OF FRUIT TREES.**IV.*

(*T. Wallace.*)

In the Report on these experiments for Season 1923 a statement was made to the effect that it was then becoming possible from the data available to form some general conclusions on certain of the points under investigation. Data were presented in that Report from the older experiments on apples, strawberries, black-currents and gooseberries in which the effects on the shoot growth, foliage characters, root systems, cropping, etc., of the plants resulting from

deficiencies of nitrogen, potassium, phosphoric acid, calcium and magnesium respectively were being investigated, and it was shown that the effects produced by any one treatment on the different plants were very similar.

It was pointed out in that Report that it was still desirable, however, to obtain further data on certain points from those experiments, *e.g.*, further crop weights—and that certain of the results obtained called for further investigation, *e.g.*, apparent magnesium starvation symptoms induced by feeding apple trees with nutrient solutions of high potash content.

Accordingly, these older experiments were continued during 1924, and experiments were also commenced to investigate various other points brought out in the 1923 results.

In addition to these, it was decided to extend the scope of the investigations to study the following points:—

1. The effect of sulphur deficiency on the various plants.
This treatment was not included in the original deficiency experiments.
2. The effects produced on the plants by complete nutrient solutions of widely different reactions, *i.e.*, acid solutions, neutral solutions and alkaline solutions; p_H values 3.0, 6.6, 9.0*

These experiments were commenced as there does not appear to be any data available on the subject of the effect of soil reaction on fruit trees. Considerable data on this subject for agricultural plants exist and modern fruit practice relating to this point is based wholly on agricultural practice.

From a considerable amount of field data which the writer has collected on this point, it is quite evident that the subject calls for very careful study. The case of soil alkalinity appears to be specially important.

3. The effects produced on the plants by acid and neutral nutrient solutions deficient in phosphoric acid, p_H values 3.0, 6.6.

This point required investigation as Solution E—phosphoric acid omitted—used in the original deficiency experiments when diluted ready for application has p_H value 4.7. whereas the other solutions used have p_H values 6.4 to 6.6. The results obtained in those experiments with Solution E might therefore have been due in part to the strongly acid reaction of the solution.

* Solutions of p_H value 3.0 are strongly acid, of p_H value 6.6 slightly acid, of p_H value 9.0 strongly alkaline.

The more important of the observations recorded during the season are given in the following notes on the experiments.

Weather during 1924 Season.

With the exception of a few days of sunshine towards the end of April, and in early July, the weather throughout the season was extremely wet and lacking in sunshine.

The plants not under shelter, *i.e.*, apples, gooseberries and blackcurrants, suffered severely at times from the heavy rain storms, and in one experiment on apples the damage from water was so severe that the trees dropped their leaves and it was impossible to pursue the investigation during the remainder of the season.

There were hard frosts on the nights of November 3rd, 4th, and after these, the amounts of foliage on the plants in many of the experiments were so small that observations on the plants were discontinued for the season.

I.—DEFICIENCY EXPERIMENTS.

(a) *Experiments on Apple Trees—Variety, Cox's Orange Pippin. Commenced 1921.*

The shoots of the trees in this experiment were all cut back to within 1 inch of the main stems during winter 1923-24 and thus during 1924 it was possible to make observations on the ability of the plants to make new shoot growth and on the foliage characters, etc., of the trees after having undergone the respective treatments for three seasons previous to 1924.

The data obtained relating to shoot growth are shown in Table I.

TABLE I.
SHOOT GROWTH OF APPLE TREES. SEASON 1924.

Series and Treatment.	No. of Trees in Series.	Total length of shoots per Series—m.ms.	Average length of shoot growth per tree—m.ms.
A.—Complete nutrient solution ..	4	3945	986.3
C.—Nitrogen omitted ..	4	100	25.0
D.—Potassium omitted ..	3	2110	703.3
E.—Phosphorus omitted..	3	230	76.7.
F.—Calcium omitted ..	4	5275	1318.8
G.—Magnesium omitted ..	4	3225	806.3
H.—Water only ..	4	120	30.0

The data relate only to the trees which are on Broadleaved Paradise Stock. It will be noted that from the point of view of shoot growth the series may be divided into two groups—one group

comprising Series A, D, F, G, in which the shoot growth is relatively good, and the other Series C, E, H, in which shoot growth is poor.

Two further points of note are that the largest amount of shoot growth has not been made in Series A, but in Series F, and that the smallest amount has not been made in Series H, but in Series C.

As the shoots have again been pruned back to the main stems it will be possible to obtain data similar to the above next season.

(b) Experiment on Gooseberry Bushes. Commenced 1922.

In this experiment it was hoped to obtain further cropping data during the season and to make further observations on foliage characters and defoliation.

The data obtained relating to cropping, however, were rendered unreliable owing to the depredations of birds during the period of flowering, at which time it was necessary to keep the plants in the orchard house owing to frost and it was found impossible to keep out the birds during periods of sunshine when it was essential to ventilate the house very thoroughly.

Accordingly, the data obtained are only being used to supplement data on the size of fruits. Certain observations were also made on the character of the fruits. The only point of note which this latter examination brought out was the poor quality of the fruits from the bushes receiving the "phosphoric acid omitted." treatment in which series the fruits lacked flavour and sweetness. Similar characteristics of fruits produced by this treatment were also noted for blackcurrants and strawberries. The gooseberry fruits in this series also exhibited the dull bronzed colour and purple spotting characteristics of the foliage of the plants of the series.

The foliage of the plants in the different series were very interesting throughout the season and showed their several characteristics very markedly.

In Series A and B—complete nutrient solutions—the foliage was in excellent condition throughout the growing period.

In Series C—nitrogen omitted—and Series H—water only—the leaves and fruits were very small and as early as May 17th the foliage was practically all reddish-yellow in colour, whilst by June 27th the leaves were almost entirely of a vivid scarlet colour.

Where potassium was omitted in Series D, the leaves became suffused with purplish-red tints and showed much curling at the edges towards their under surfaces by May 24th, whilst on May 31st all the bushes exhibited brown marginal leaf scorch on the foliage.

The plants in Series E—phosphoric acid omitted—made practically no growth during the season. The amount of foliage from

the beginning was relatively small and was confined to the areas near the tips of the shoots. The leaves were small, dull green in colour and soon became entirely bronzed in appearance, showing a characteristic purple spotting. A considerable proportion of the foliage was shed during a few hot days in the latter part of May and from June onwards the bushes only carried a little poor bronzed foliage.

In Series F—calcium omitted—the plants, as in former years, did not show any well defined symptoms, but from time to time the leaves looked rather pale and there were some red bands developed on them as in Series G.

In Series G—magnesium omitted—the plants made very large growth. The foliage of all plants became strongly tinted in characteristic fashion but the leaves were not shed prematurely.

Some idea of the relative growths made by the bushes during the period of experiment will be obtained from consideration of the data presented in Table II. The data refer only to bushes receiving leaching treatment.

TABLE II.
HEIGHT AND SPREAD OF GOOSEBERRY BUSHES. DECEMBER, 1924.

Series.	No. of bushes.	Height of bushes. Totals m.ms.	Height of bushes. Average per bush m.ms.	Spread of bushes. Totals m.ms.	Spread of bushes. Average per bush m.ms.
A.	7	2640	377.1	3430	490.0
C.	6	1550	258.3	1130	188.3
D.	7	2450	350	2530	361.4
E.	7	2080	297.1	2010	287.1
F.	7	2550	364.3	2610	374.3
G.	7	3090	441.4	3150	450.0
H.	7	1920	274.3	1390	198.6

With regard to the relative orders of defoliation of the plants during the season, the following observations, made on September 19th, will indicate how this proceeded.

September 19th—Order of Retention of Foliage.

Series F, A and G, B.—Very little defoliation.

Series D.—40 to 50% defoliation.

Series C and H.—Only few red leaves retained.

Series E.—Practically defoliated.

Subsequently, defoliation in Series F, A, G, B proceeded practically simultaneously.

(c) *Experiment on Blackcurrant Bushes. Commenced 1922.*

Further data were obtained during the season on the growth characters and cropping of the plants. The fruit crop was very small in all series as the blossom set very badly, which was most probably due to the dry atmospheric conditions obtaining in the orchard house during the blossoming period. Blossoming and fruiting were much less in Series C, E and H than in any other series as, in these series, the development of lateral buds has been greatly restricted by the treatments given.

The relative amounts of growth made by the plants in the various series were similar to those made by the gooseberry bushes under the similar treatments, those in Series C, E, and H failing to make any appreciable amounts of growth.

Of the various foliage characteristics noted during the season, perhaps the only points worthy of special mention in this report were the extreme sparsity and poor condition of the foliage in Series E—phosphoric acid omitted—and the leaf size of the plants in Series D—potassium omitted. These latter plants dropped practically all the larger leaves along their shoots during the middle of the season and retained only foliage comprised of very small leaves, which condition gave the plants the appearance of being, to a large extent, defoliated.

The amounts of shoot growth made during the season are shown in Table III.

The data refer only to bushes receiving leaching treatment.

TABLE III.
SHOOT GROWTH OF BLACK CURRANT BUSHES, SEASON 1924.

Series.	No. of bushes.	Total shoot growths m.ms.	Shoot growth Average per bush m.ms.	Total number of shoots. m.ms.	Average length per shoot. m.ms.
A.	8	24885	3110.6	327	76.1
C.	8	1110	140.0	70	15.9
D.	7	15680	2240.0	346	45.3
E.	8	4715	589.4	95	49.6
F.	8	25065	3313.1	293	85.6
G.	8	24035	3004.4	313	76.8
H.	8	980	122.5	70	12.4

It is of interest to note that in Series C, E, H, not only is the length of shoots restricted, but the actual number of shoots is much smaller than in the other series.

The order in which defoliation occurred is illustrated by the following notes made on September 28th.

Order of Retention of Foliage—September 28th.

Series A, B, F, G.—The individual plants of these series retained from 60 to 80% of their original foliage.

Series D.—The amount of foliage retained was less than in Series A, etc. The actual amount of defoliation was difficult to estimate owing to the replacement of the original larger leaves with later developed small leaves.

Series C, H.—All practically defoliated. The bushes only retained a few semi-dried out leaves.

Series E.—All defoliated.

Defoliation in Series E commenced as early as May 31st, and on June 27th it was estimated that the plants were 80% defoliated.

(d) Experiment on Raspberry Plants. Commenced 1923.

As it was decided to use the plants in this experiment to obtain further growth data during 1924, the canes made by the plants during 1923 were cut away during the winter so as to deplete the food reserves within the plants and to prevent fruiting so that the efforts of the plant would be concentrated on cane growth.

Accordingly, the data accumulated during 1924 relate wholly to growth and foliage characters.

The rate of shoot development was followed throughout the season and the actual numbers of canes thrown, together with their lengths and weights, were taken after defoliation. These data are presented in Table IV.

The main points brought out by the data are as follows :—

- (a) The length of the canes was greatly restricted by treatments C, H and to a less extent by treatments D, E.
- (b) The numbers of canes per plant in Series C, E, H were smaller than in the other series. The largest numbers of canes per plant were developed in Series A.
- (c) The weights of the canes in Series C, H were very small in comparison with those in the other series. The weights were also relatively small in Series D, E.

Comparison of the data with those obtained in 1923*—the first season of the experiment—show very clearly how much the growth

* Annual Report 1923, page 52.

has fallen off in Series E in comparison with the other series during 1924. This was predicted in the Report for 1923.

The plants in Series F made better growth during the season than in 1923.

With regard to the types of foliage carried during the season, these were similar to those described for the previous season with the exception that at no time during the past season did the foliage in Series E look a healthy green. The leaves in this series remained small and were dull green with much bronzing from a very early date.

TABLE IV.
GROWTH MEASUREMENTS OF RASPBERRY CANES, SEASON 1924.

Series.	No. of plants.	Total length of canes. m.ms.	Average lengths of canes per plant m.ms.	Total No. of shoots.	Average lengths per shoot m ms.	Total weight of canes gms.	Average weights of canes per plant gms.
A.	10	27630	2763.0	58	476.4	346.3	34.63
C.	10	2115	211.5	21	100.7	11.5	1.15
D.	10	14580	1458.0	41	355.6	139.3	13.93
E.	10	11015	1101.5	28	386.3	111.2	11.12
F.	7	17510	2501.4	32	547.2	200.2	29.89
G.	10	23610	2361.0	39	605.4	296.9	29.69
H.	10	2310	231.0	24	96.3	10.5	1.05

Defoliation.

The observations made on defoliation were spoilt to a certain extent in the latter stages by a severe attack of red spider on the plants, against which it became necessary to spray and this, unfortunately, caused considerable defoliation.

The notes made, however, were sufficient to show the general trend of defoliation and these verified the results obtained in 1923. The observations made on September 14th show the general order.

Order of Retention of Foliage—September 14th.

Series A, D—50 to 60% of foliage retained.

Series F—40 to 50% of foliage retained.

Series G, E—20% of foliage retained.

Series C, H—Only retained a little foliage at the tips of the shoots.

Defoliation may be said to have been hastened to a marked extent in Series G, E, C, H. It is of interest to note the premature defoliation in Series G, as this was noted last season. It has also been observed each year on apple trees.

(e) *Experiment on Strawberry Plants. Commenced 1921.*

In previous reports on the plants in this experiment, data have been presented for growth and foliage characteristics during various periods of the season, for time of blossoming and fruiting and for crop weights.

Season 1924, being the fourth season over which this experiment has been continued, the plants have only made very poor growth and for the greater part of the season they have had the appearance of being exhausted. Even in Series A—complete nutrient series—the plants have remained small and the quality of the foliage has been poor. However, the relative amounts of growth made by the plants in the various series were similar to those of previous seasons whilst the foliage characters exhibited—tints, leaf size, etc.—were as described for previous years.

One interesting point with regard to the foliage of the plants in Series D—potassium omitted—was noted during the latter part of the season. After these plants had fruited most of the older foliage on the plants died down and fresh young foliage was developed. This foliage consisted of numerous extremely small leaves, which between the end of June and the middle of August made practically no growth, the plants remaining very dwarfed. Between the latter date and October 31st, these plants made more growth but never reached normal size.

Towards the end of the season the plants in all series looked very much worn out. It is doubtful whether they will be able to start into growth in 1925.

As blossom formation during the season was very irregular and the crop weights obtained very small, it was thought that no useful purpose would be served in including the data relating to these in this report and hence they have not been included.

(f) *Experiment on Sulphur Deficiency. Commenced 1924.*

Experiments on sulphur deficiency were commenced in the spring of 1924 with apple trees—variety, Cox Orange Pippin, gooseberry bushes—variety, Keepsake, blackcurrant bushes—variety, Seabrook's Black, and strawberry plants—variety, Royal Sovereign.

The procedure followed was as in previous deficiency experiments with these plants.

The solution used was made from Solution A by substituting chlorides for sulphates in every case where a sulphate was used in that solution.

Observations during the season were confined to shoot growth, foliage characters and defoliation.

With regard to shoot growth, one season is insufficient from which to draw conclusions and hence the data relating to this are not presented here.

The indications, however, are that shoot growth will be greatly restricted in apples and gooseberries. Growth in the strawberries appeared also to have been checked but the blackcurrant bushes did not show much falling off in growth over the season.

All the plants used exhibited a similar condition with regard to colour of foliage, viz :—the green colour of the leaves became very pale during July and August and, later, brilliant orange and red tints were developed. In addition, the leaves of gooseberries and strawberries developed narrow marginal red bands.

In general, it may be said that the condition of the foliage resembled that of plants suffering from partial nitrogen deficiency.

Judging from the behaviour of the gooseberry and blackcurrant bushes, it looks as though in future seasons plants under this treatment will be defoliated in advance of those receiving complete nutrient solutions.

II. EXPERIMENT TO DETERMINE THE EFFECT ON THE PRODUCTION OF LEAF SCORCH OF APPLE TREES OF ALTERING THE RATIO $\frac{\text{NITROGEN}}{\text{POTASSIUM}}$ AND OF ADDING A SOLUBLE SILICATE TO THE COMPLETE NUTRIENT SOLUTION PREVIOUSLY USED—VARIETY, COX ORANGE PIPPIN.

No definite results were obtained on leaf scorch in this experiment during the season owing to the fact that in all the series the trees lost a large percentage of their foliage from the action of the excessively heavy rains and the foliage which was retained did not show any considerable amount of leaf scorch under any treatment.

The observations made in 1923 on the point that in the series where the trees were fed with a nutrient solution containing relatively high amounts of potash salts the leaves exhibited centre blotches of dead tissue similar to those produced by magnesium deficiency were verified.

Further results obtained on this point on apples, blackcurrants and gooseberries are reported overleaf. (*Experiment III*).

The effects produced by the rain on the leaves of these trees led to another line of investigation being pursued during the year the results of which will be reported elsewhere.

This experiment has been discontinued as the results which have been obtained to date in this and other experiments of a similar character have furnished the data required of them.

III. EXPERIMENT ON THE RATIO $\frac{\text{POTASSIUM}}{\text{MAGNESIUM}}$ IN NUTRIENT SOLUTIONS.

As previously stated, these experiments were commenced as the result of observations made in 1923 on apple trees fed with a complete nutrient solution having a relatively high $\frac{\text{potassium}}{\text{magnesium}}$ ratio.

The trees so fed developed symptoms of leaf blotching characteristic of leaves of apple trees fed with nutrient solutions deficient in magnesium.

In order to discover whether the blotching was due to this ratio, it was decided to test the solution used in that experiment on gooseberry and blackcurrant bushes as these plants show magnesium deficiency symptoms in a manner dissimilar from apple trees and from each other and further to endeavour to check the development of the symptoms by feeding plants with a solution containing the same amount of potassium as in the previous solution but with the amount of magnesium increased threefold.

The following plants were used in the experiment :—5 apple trees—variety, Cox Orange Pippin; 10 gooseberry bushes—variety, Keepsake; 10 blackcurrant bushes—variety, Seabrook's Black.

The two nutrient solutions were marked S and K respectively, S having the high $\frac{\text{potassium}}{\text{magnesium}}$ ratio. All five apple trees were fed with

Solution K, as trees fed with Solution S were already available for comparison, whilst of the gooseberry and blackcurrant bushes, five of each received Solution S and five Solution K. The solutions were applied to the plants as in the other pot experiments and the sand was leached through as usual at short intervals.

The observations made on the plants were as follows —

Apple Trees.—The foliage in Series K became affected with blotch to a slight extent, but never to the degree of that on the trees fed with Solution S where blotch was very severe and led to much premature defoliation.

The shoot growth and size of the leaves in Series K were also smaller than in Series S.

Gooseberry Bushes.—There was a very marked difference between the foliage of the bushes in the two series from July 16th to the time of defoliation. By July 16th, the foliage of all plants receiving Solution S was showing marked symptoms identical with those associated with magnesium deficiency whilst that in Series K was fresh and green. Eventually two plants in Series K developed the symptoms, but these were never severe. During the latter part of the season the foliage in Series S became very poor whilst that in Series K remained normally green. Defoliation took place at an earlier date in Series S than in Series K, the plants in the former series having lost approximately 40% of their summer foliage by October 22nd, whereas on that date, in the latter series, the plants had not lost 20% of their foliage.

Blackcurrant Bushes.—The plants in both series made excellent growth throughout the season, and there were no differences in the appearance of the plants until August 23rd. On this date it was noted that the older foliage of the plants receiving Solution S was dying down more quickly than that of the plants receiving Solution K. From this date defoliation proceeded more quickly in Series S than in Series K, whilst the plants in the former Series also showed much more purpling of the foliage than did those in the latter Series.

Thus with all three test plants the tendency during the season was for the foliage of the plants receiving the high $\frac{\text{potassium}}{\text{magnesium}}$ ratio to exhibit symptoms of magnesium starvation, whereas those receiving the lower $\frac{\text{potassium}}{\text{magnesium}}$ ratio did not show the symptoms to anything like the same extent.

It is possible that this ratio, $\frac{\text{potassium}}{\text{magnesium}}$, is of importance in apple and raspberry culture in cases where dung is not procurable as with these plants magnesium deficiency is attended by very serious premature defoliation. Strawberry plants also appear to suffer rather badly under certain conditions when receiving a diet low in magnesium. Gooseberry and blackcurrant bushes have not suffered to the same extent as the above plants in pot experiments carried out at this Station.

IV.—EXPERIMENTS WITH COMPLETE NUTRIENT SOLUTIONS OF WIDELY DIFFERING P_H VALUES—3.0, 6.6, 9.0.

The reasons for carrying out these experiments are given earlier in this report.

Experiments were commenced on the following plants :—

Variety.			
APPLES	..	Devon Quarrenden	6 trees per treatment.
GOOSEBERRIES	..	Keepsake ..	5 bushes ..
BLACKCURRANTS	..	Seabrook's Black ..	5
RASPBERRIES	..	Bath's Perfection ..	3 plants ..
STRAWBERRIES	..	Royal Sovereign ..	5

The plants are being grown under conditions of treatment similar to those in the other pot experiments but the sand is never leached.

The solutions used are designated Acid A with $p_H = 3.0$, A with $p_H = 6.6$, Alkaline A with $p_H = 9.0$, Solution A being the complete nutrient solution in general use in the pot experiments, whilst the other two solutions are made from it by adjusting the p_H values to the desired figures by the addition of the necessary amounts of sulphuric acid or caustic soda solutions.

The results obtained to date have not been very pronounced with any of the plants, although there were indications towards the end of the season that the acid solutions were producing definite effects on the apple trees, blackcurrant bushes and strawberry plants. It would be premature, at this stage of the investigation, to deal in detail with the observations made and hence these are being withheld for the present.

V.—EXPERIMENTS WITH NUTRIENT SOLUTIONS DEFICIENT IN PHOSPHORIC ACID WITH p_H VALUES 3.0, 6.6.

These experiments are being carried out on apple trees—variety, Cox Orange Pippin; gooseberry bushes—variety, Keepsake; blackcurrant bushes—variety, Seabrook's Black; and strawberry plants—variety, Royal Sovereign.

Ten plants are under treatment in each experiment—five per treatment—except in the case of the apple trees, where five only are being used, no treatment with solution with p_H value = 3.0 being given.

The solutions used are made from the stock solution E, which contains no phosphoric acid, by adjusting to the required p_H values.

The series were designated E— $p_H = 3.0$; EN— $p_H = 6.6$.

The procedure followed is as for other pot experiments, the sand being leached with water at intervals.

From a very early date in the season all plants under experiment showed very markedly the symptoms which have been produced in all previous experiments with the original Solution E, which is a

complete nutrient solution less phosphoric acid and has p_H value 4.7. These symptoms, which have been described in previous Reports, take the form of bronzing and purple spotting of the foliage, such affected foliage being shed at a very early date during the season.

The symptoms were first noted on the various plants in the experiment on the undermentioned dates and appeared practically simultaneously in both series for the different plants.

Apple trees	July 16th.
Gooseberry bushes ..	July 16th.
Blackcurrant bushes	June 27th.
Strawberry plants ..	June 27th.

The symptoms developed very rapidly on all plants after these dates and shoot growth was greatly in arrears of other plants, receiving complete nutrient solutions whilst the plants were defoliated at early dates.

During the latter portion of the season the gooseberry and blackcurrant bushes in Series E were in rather worse condition than those in Series E N, but the differences were only slight.

From the results obtained during the season there appears to be no doubt that bronzing and purple spotting of the foliage and the various other symptoms which have been produced on plants receiving the nutrient solution E (phosphoric acid omitted with $p_H = 4.7$) are to be attributed to deficiency of phosphorus.

NOTE ON THE DEVELOPMENT OF ROOT SYSTEMS OF WILLOW CUTTINGS IN NUTRIENT SOLUTIONS.

(T. Wallace and H. P. Hutchinson.)

The experiments described herein were undertaken in order to see whether results could be obtained in a relatively short time on the characters of root systems developed by woody plants in nutrient media lacking in one of the essential elements of plant food.

Similar experiments on various fruit trees and willows in sand culture have been in progress at this Station during the last few seasons, but by this method results on the subject of root formation only become available very slowly.

It occurred to us that such results might be obtained relatively quickly by growing willow cuttings in water culture as it has been noted in the case of previous experiments that willow sets will root and shoot freely in water when cut from the plant at any

time during the growing season. Accordingly, sets 10 inches in length were taken from a variety of the species *Salix triandra*, and in order to secure uniformity in size and condition of growth the terminal portions of equally sized and equally developed rods were used.

The solutions used in the experiment were as under and were those in general use at this Station for pot culture work.*

A.—Complete nutrient solution.	pH 6.8.
Acid A.—,, ,,	pH 3.0
C.—,, ,,	less nitrogen
D.—,, ,,	,, potassium
E.—,, ,,	,, phosphoric acid
F.—,, ,,	,, calcium
G.—,, ,,	,, magnesium
H.—Water only.	

The water used in making up the nutrient solutions was in every case distilled water.

The solutions in which the cuttings were immersed were contained in boiling tubes—100 cc. of solution per tube—and the tubes were plunged in silver sand in plant pots. Three tubes were plunged in each pot and were passed through holes in cardboard discs covering the pots, the object of the discs being to prevent the sand from becoming heated to a high temperature by the sun's rays.

The nutrient solutions were changed very frequently to prevent the volumes of the nutrient solution in the tubes becoming appreciably reduced.

The cuttings were immersed immediately after cutting in the nutrient solutions—three per treatment in one tube—on February 28th and during the whole time of the experiment, which lasted until August 1st, the tubes were kept in a cold greenhouse.

The cuttings were breaking into growth at the time of transferring to the nutrient solutions and suffered a check from the operation. External lenticular tissue development along the portion of the cuttings immersed in the solution was noted after three days and root protrusion and bud burst were complete after twelve days. There were no differences between the amounts of growth made under the various treatments to this date, but from this time differences both of shoot and root development became marked.

From April 1st onwards the cuttings made excellent growth, of both shoot and root, in the complete solution A, and by April 30th large root systems had been made. On this date the roots

* Annual Report of this Station 1921, p. 43.

of two plants per treatment were shaved off with a sharp razor and replaced in their respective solutions to make new root systems, one cutting per treatment being left untouched.

By June 11th the treated shoots in Series A had again made good root systems and the root pruning as for April 30th was repeated on the two cuttings per series previously treated. The plants were grown on again until August 1st, during which period further root systems were developed.

It was thought that by such pruning we should deplete the food reserves so thoroughly as to obtain a true picture of the root systems as influenced by the respective nutrient treatments.'

The root systems of the cuttings were kept under close observation during the whole period of the experiment, photographs of those of the treated plants being taken on April 26th, June 11th and August 1st, just previous to the pruning operations.

The various characteristics of the root systems noted are given below.

Before dealing in detail with the observations made on the root systems it will be of interest to deal briefly with the nature of the shoot growth of the cuttings of the various series.

Series A.—From an early stage shoot growth was very vigorous and healthy.

Series Acid A.—Similar to A.

Series C.—Shoot growth poor and leaves yellowish green.

Series D.—Poor. Leaves had developed "Chlorosis" by April 30th.

Series E.—Poor. Leaves dull green colour.

Series F.—Poor. Leaves were strongly "Chlorotic" by April 30th.

Series G.—Shoot growth as A.

Series H.—Growth very poor.

The shoot growth as above was severely checked by the root prunings, so much so that after the second pruning operation shoot growth was almost at a standstill in all series. The cuttings, however, continued to make considerable root growth except in G and H. in which series the plants were practically killed by the second pruning.

ROOT SYSTEMS.

April 1st.—On this date the root systems in Series A, Acid A, and G were making excellent growth both of primary roots and secondary fibre.

D and E were somewhat behind the above and the fibre was proportionately less in amount to the amount of primary roots.

F, C and H were smallest. the amount of secondary fibre being larger in C than in F and H.

April 26th.—By this date there were well marked differences between the root systems of the various series.

A, Acid A, E and G.—These roots were similar in appearance, the plants having made good growth of primary roots and plenty of secondary fibre. A roots were somewhat larger than those of the other series.

D.—The primary roots in this series were fairly well developed but the growth of the secondary fibre was very poor.

C.—The primary roots were much shorter and thinner than A. and the secondary fibre was rather poorer in proportion.

F.—Both primary roots and secondary fibre were poorly developed.

H.—Primary roots were very small and secondary fibre practically undeveloped.

April 30th —First root pruning operation carried out.

OBSERVATIONS ON ROOT PRUNED PLANTS.

May 24th. A, Acid A, and G.—Primary roots and secondary fibre were again well developed.

C.—The root systems were much smaller than A, but the amounts of primary roots to secondary fibre were normal in character.

D.—Primary roots were fairly well developed but there was scarcely any secondary fibre.

E.—One root system was rather poor. The other, although somewhat smaller than in A. was normal as regards the relation of primary roots to secondary fibre. The poor root was yellowish pink in colour.

F.—The primary roots were very poor and there was practically no development of fibre.

H.—Practically no root development.

May 31st.—By this date the lack of fibre in relation to the amount of primary root development had become accentuated in Series D and F.

June 13th.—Second root pruning operation carried out.

June 27th.—A, Acid A.—Both primary roots and secondary fibre developed

C.—One plant, primary roots and secondary fibre developed. Other plant, poor development.

D.—Thin primary roots thrown. No secondary fibre.

E.—One plant, thin primary roots with secondary fibre. Other plant, poor development.

F.—Fairly long primary roots thrown. No secondary fibre.

G.—Very poor development in both plants. Practically killed by the second pruning.

H.—No roots.

July 16th.—To this date the roots had developed along the lines indicated under June 27th; Series D and F plants failing to make secondary fibre of any size in proportion to the primary roots made by them.

No roots were made by the plants in Series H.

In all other series, although the root systems were of varying sizes, the amounts of secondary fibre developed were in proportion to the growths of primary roots.

Observations made between this date and August 1st, when the experiment was concluded, were similar to those recorded on July 16th and served to make clear the point that the root systems formed by plants in the solutions D and F, from which potassium and calcium respectively were omitted, were markedly deficient in secondary fibre.

CONCLUSION.

As the result of observations made in this experiment we are particularly desirous of drawing attention to the characters of the root systems formed by growing cuttings in nutrient solutions deficient in potassium and calcium respectively.

In both cases, the observations point to the fact that under such conditions the root systems are markedly deficient in fibre.

We may say that we obtained identical results in similar experiments which we carried out in 1923 and a similar result was obtained by one of us (T.W.), with apple trees in sand cultures in 1921 in cases where potassium was omitted from the diet of the trees.

**THE PHYSIOLOGY OF THE NUTRITION OF FRUIT TREES.—I.
SOME EFFECTS OF CALCIUM AND POTASSIUM STARVATION.**

(C. E. T. Mann.)

Problems bearing on the nutrition of various fruit trees have formed subjects of investigation both in this country and in America for some time past. Primarily these problems were investigated in the field, but results obtained from many field experiments have been shown to have only a limited application. Under field conditions, on any experimental plot, generally only one or two special points can be studied and so many factors difficult to control are usually present that the interpretation of results is rendered very difficult. Such experiments with fruit trees are also very costly as they require large areas of land and considerable labour for their proper conduct whilst results are only obtained very slowly.

To obviate the difficulties and limitations presented by field experiments workers in the past have employed the method of pot experiments by which various problems may be studied under conditions which allow of much stricter control than is possible in the field. In such experiments plants are grown in sand or water cultures and the various factors of the problem under investigation may be studied by more or less refined laboratory methods.

Typical examples of the application of this method to problems of plant nutrition are afforded by the work of Hoagland (6,7) on the nutrition of cereal crops, of Reed and Haas (12,13) on the "mottle-leaf" of citrus trees and of Wallace (15) on the nutrition of apples, blackcurrants, gooseberries and strawberries.

With reference to the work on fruit trees, the sand culture method employed in these experiments has many obvious advantages over the field method in the study of special problems. The plants are grown in sand to which the various mineral foods may be supplied as desired in the form of culture solutions. External conditions of light, temperature and humidity may be controlled and furthermore the difficulty of pest control, which has often greatly vitiated the results of many field experiments, is minimised.

In applying this method to the solution of nutritional problems it is usual to test the conclusions arrived at in the pot experiment by field experiments selected as likely to provide the necessary test conditions.

The following will serve as concrete examples of nutritional problems which have been studied by pot culture methods.

- (a) The effects produced on plants of deficiencies of the various essential elements of food.



Photo]

PLATE I.

Comparable trees from Series M.A. and M.D. The tree on left (M.A.) received a complete culture solution and the tree on the right (M.D.) received a culture solution containing no potassium salts. Note the curled appearance of the foliage and the extent of defoliation in the potassium starved tree.

[W. Camps.



Photo]

PLATE II.

[*W. Camps*
Comparable trees from Series M.A. and M.F. The tree on the left is the same as M.A. in Plate I which received a complete culture solution. The tree on the right (M.F.) received no calcium salts. Note the stronger shoot growth and very much larger leaves of the calcium starved tree as compared with the tree which received a complete culture solution.

- (b) The effect of varying the ratios of the elements of plant food in culture solutions on the growth and development of plants.
- (c) The influence on growth of excess of any particular essential element, e.g., nitrogen or potassium.

Much of the work previously carried out on such problems has been of a qualitative nature.

In deficiency experiments valuable information has been recorded on the appearance exhibited by various fruit trees when certain elements of the plant food are withheld (15). When phosphates were withheld trees or bushes showed very weak growth and defoliated extensively at an early date so that only a small amount of foliage, near the tips of the shoots, was retained during the greater part of the season. Again, if potassium salts were omitted the foliage on the plants in these cultures invariably suffered from leaf-scorch. Throughout the experiments it has been shown that the omission of a single element from the "complete" culture solution supplied is reflected in the growth of the plant and normal development does not proceed in the absence of one of the essential elements. Each essential element thus constitutes a limiting factor in the growth of a plant. If one of these elements be deficient, though the remainder be present in adequate amounts, growth and development will be limited by the deficiency.

In experiments in which the proportions between certain elements in the culture solution was varied it was shown that these variations were reflected in the plant. Apple trees grown in sand cultures received a culture solution containing an insufficient amount of potassium and a small amount of leaf-scorch was observed on the foliage. By increasing the amount of nitrogen in the culture solution leaf-scorch became considerably more severe. When the proportion of nitrogen was decreased leaf-scorch did not develop. These observations indicate that in the absence of an adequate supply of potassium the trees were unable to support the area of foliage produced. The suggestion is supported by the fact that when the production of large leaves is stimulated by the addition of nitrogen leaf-scorch, which reduces the area of living foliage, becomes more pronounced. Conversely, by reducing the nitrogen supply and consequently rendering the plant less vigorous vegetatively, the potassium supply appears to be adequate for the smaller leaves produced and leaf-scorch does not occur. This example serves to indicate that for normal development to proceed, a part

from the actual presence of the essential elements, these constituents of the plant food must be present in certain proportions.

Since 1921 various aspects of the problem of leaf-scorch have been under investigation at this Research Station (2, 3, 4, 14, 15). Certain data which have been accumulated have indicated the desirability of studying the problems relating to the water supply to, and the loss of water from leaves of "scorched" trees or bushes.

In sand culture experiments it has been shown that if potassium salts are deficient in the culture solution supplied then the foliage produced invariably develops "leaf-scorch." It therefore appeared desirable to use such plants in work on the water relations of the foliage of scorched trees. Observations made on trees, in pot experiments, which received solutions deficient in calcium have indicated that such trees might be profitably included in any study of the water relations of leaves, as the leaves produced on these trees have been characterised by their large size and the absence of leaf-scorch. These facts suggest that the conditions affecting the water relations within the leaves when calcium is deficient are directly opposite to those obtaining when potassium is deficient.

With a view to investigating the water relations of apple leaves as affected by changes in the composition of the culture solution supplied a series of sand culture experiments was designed. The experiments described in the following sections deal particularly with the effects produced on the foliage of apple trees when the trees are grown in the absence of either potassium or calcium. Access was also obtained in the course of the work to series of gooseberry bushes growing under similar conditions.

EXPERIMENTAL.

Cultural Method.

The cultural method employed was similar to that used by Wallace in experiments on the manuring of fruit trees and described in detail in an earlier report (15). For convenience, the essential features of the method are recapitulated here. The trees after being headed and root pruned by the Stringfellow method, are planted singly in waxed pots containing washed silver sand. Culture solutions are supplied to the plants as required. As the trees are set up in the open, a waterproof cover is fitted over each pot. This covering serves the double purpose of excluding rain and preventing rapid loss of water by evaporation from the surface of the sand. To prevent too great accumulation in the sand of substances supplied in the culture solution a method of leaching is

employed. Periodically excess water is added to each pot, the water being allowed to drain out, thus carrying away any excess of soluble compounds.

On April 4th thirty maiden trees, of the variety Cox's Orange Pippin on broadleaved Paradise stock, were planted in large waxed pots. These trees were divided into three series of ten and culture solutions were supplied throughout the season. To the first series (Series M.A.), a "complete" culture solution was supplied, the composition of which is given below.

COMPOSITION OF COMPLETE CULTURE SOLUTION. M.A.

Potassium nitrate.. .. .	8.0 grms.
Sodium chloride	1.0 ..
Di-potassium mono-hydrogen phosphate ..	1.0 ..
Calcium sulphate	1.0 ..
Magnesium sulphate 7H ₂ O	1.0 ..
Ferric chloride	0.4 ..
Distilled water	1 litre.

This stock solution was diluted with 9 litres of water for application.

To the second series (Series M.D.), a culture solution containing no potassium was supplied. This solution was a modified form of the "complete" solution in which the potassium salts were replaced by the necessary quantities of corresponding sodium salts.

The third series (Series M.F.) received a culture solution containing no calcium. This solution was similarly prepared by substituting the requisite amount of sodium sulphate for the calcium sulphate used in the complete solution.

Five trees in each of the series M.D. and M.F. received culture solutions prepared and diluted with distilled water. The remaining trees received solutions diluted with rain water.

After planting, two trees from each series were placed in an orchard house and the remainder were set up in the open.

Observations were made on all the trees at various intervals throughout the growing season. A summary of the observations made on the trees of each series growing in the open is given below. The main points of difference between these trees and those placed in an orchard house are described at the end of the summary.

General Observations.

The trees in all series, except one in Series M.A., made a satisfactory start and no marked differences were observed during the first three weeks.

June 13th.

Series M.A. (Complete culture solution).

The trees in this series appeared quite normal. Shoot growth was good and the foliage healthy.

Series M.D. (Potassium omitted.)

The trees in this series were behind those in Series M.A. in general development. Shoot growth was less vigorous and rather spindly. The leaves appeared rather darker green and the leaf tips in many cases showed a tendency to curl towards the under surface.

Series M.F. (Calcium omitted).

The general development of the trees in this series was slightly in advance of that in the Series M.A. Shoot growth was stronger and the leaves appeared slightly larger.

June 24th.

Series M.A. ("Complete" solution).

Normal growth had occurred and the foliage was healthy.

Series M.D. (Potassium omitted).

On the newly developed shoots the lower leaves except those forming the basal rosette were suffering from leaf-scorch. Typical stages of this trouble were observed from the leaf with the scorched tip to the stage in which the margin of the leaf was completely affected. In severe cases the scorched leaves had fallen.

Leaf-scorch was equally severe on all the trees and no significant differences were observed between the trees receiving the culture solution prepared with rain water and those receiving the same solution prepared with distilled water.

Series M.F. (Calcium omitted).

The general growth and vigour of the trees in this series was clearly in advance of that of the trees in Series M.A. The foliage produced was healthy and the leaves were larger than those in the "complete" series.

There were no observable differences between those trees receiving rain water solutions and those receiving distilled water solutions.

Comparable trees from each series were photographed on this date and the general appearance of the trees is shown in Plates I and II.

June 28th.

A form of "spotting" was observed on the foliage of some trees in each series. The leaves affected showed small areas of dead tissue which appeared sporadically in the leaf-blade. The death of the leaf tissue appeared to follow a purplish discolouration of the cells in the affected area and this purplish colour was often observed around the dead spots which increased in size progressively. The same "spotting" was observed on other trees of the same variety in pot experiments and in the plantations.

This trouble was not confined to the foliage of the trees of any particular series but was generally slight in all.

Apart from this observation the general observations on the three series were essentially the same as those recorded above.

July 7th.

Series M.A. ("Complete" culture solution).

The general development of the trees was good but the older leaves in certain cases no longer exhibited a normal healthy appearance. In these leaves portions of the leaf-blade, between the sub-main veins and roughly mid-way between the main vein and the margin of the leaf, appeared to be affected. In the early stages small dull green areas were observed in these positions, the dull appearance seemed to be due to complete drying out of the cells in these regions. Later stages showed, in the centres of the affected portions, patches of dead tissue. These dead areas increased in size progressively both towards the main vein and towards the margin. The leaves affected exhibited a "blotched" appearance, the "blotches" being separated by narrow regions of healthy tissue abutting on the veins. In severe cases the "blotches" had so increased in size that the centre of the leaf, except for these narrow regions along the veins, was quite dead. This symptom, which for convenience and from appearance has been termed "blotching," was quite distinct from the spotting trouble previously observed. Frequently both were observed on a single leaf.

Series M.D. (Potassium omitted).

Leaf-scorch was severe on the foliage of all the trees. Extensive defoliation had occurred. The latter formed leaves

were considerably smaller than those in Series M.A. A small amount of spotting was noted but careful examination failed to reveal any sign of the "blotching" symptom described above.

Series M.F. (Calcium omitted).

Shoot and foliage development was well in advance of that in Series M.A.

"Blotching" was observed on the older leaves in this series and appeared to be slightly more severe than in Series M.A.

August 7th.

Series M.A. ("Complete" culture solution).

The trees were still growing vigorously and producing strong growths and healthy foliage.

The lower leaves showed severe "blotching" and some defoliation of affected leaves had occurred.

Series M.D. (Potassium omitted).

The general growth of the trees was poor in comparison with the trees in Series M.A.

Extensive defoliation of badly scorched foliage had occurred.

No sign of "blotching" was observed.

Series M.F. (Calcium omitted).

The same general differences between the trees in this series and those in M.A. were observed. "Blotching" of older leaves was more severe than in M.A. and more extensive loss of affected foliage had occurred.

Observations made at subsequent periods differed little from those recorded above. "Spotting" of the foliage increased in severity with the advance of the season. Defoliation of leaves suffering from blotching continued in the two Series M.A. and M.F. In the Series M.D. it was observed that the later formed leaves were considerably smaller than the leaves in Series M.A. These leaves were less severely scorched and defoliation was checked. No sign of blotching was observed at any time during the season in this series. On October 24th the trees in all three series retained a small amount of foliage. Defoliation was complete on the following dates. Series M.D.—October 28th, Series M.A.—November 4th, Series M.F.—November 19th.

The observations made on the two trees from each series which were placed in the orchard house immediately after planting differed

Leaf Measurements.

TABLE I.

THE EFFECT OF THE COMPOSITION OF THE CULTURE SOLUTION ON
THE AREA OF THE LEAVES PRODUCED BY APPLE TREES IN
SAND CULTURES.

(a) TREES IN THE ORCHARD HOUSE. JUNE 23RD.

Series	Culture solution supplied.	Leaf Areas in Sq. Cms. In order of development.										Totals.
		Apex.	In order of development.								Base.	
		1st leaf	2nd leaf	3rd leaf	4th leaf	5th leaf	6th leaf	7th leaf	8th leaf	9th leaf	10th leaf	
M.A.	"Complete" Omitting potassium Omitting calcium.	2.05	4.32	8.87	13.96	18.46	19.30	18.40	17.42	15.39	12.32	130.29
M.D.		1.43	5.16	8.32	10.44	12.80	12.98	12.32	14.38	11.36	8.28	97.47
M.F.		3.54	7.97	13.43	22.68	32.64	36.42	37.62	41.60	40.64	27.86	264.40

(b) TREES IN THE OPEN. JULY 30TH.

M.A.	"Complete"	4.93	9.31	16.0	18.76	21.22	21.24	20.44	20.8	20.4	19.18	172.28
M.F.	Omitting calcium	4.3	10.96	16.18	22.52	26.17	27.50	25.10	23.96	23.14	24.26	204.09

It is generally believed that the supply of water is a factor in the production of large leaves. Heinicke (5) has shown that apple twigs abundantly supplied with water produce larger leaves than similar twigs receiving a smaller water supply. From the data recorded on the area of the leaves produced in the various cultures it appears possible that the differences in the size of the leaves may be due in part to alterations in the water supply maintained by the trees. Assuming that the trees in Series M.A., receiving a "complete" culture solution, maintain a normal water supply, then potassium starvation may result in a reduction of the normal water balance, whilst calcium starvation may result in the maintenance of a higher water balance. The position of the water balance within a plant is determined by the power of the roots to maintain the supply and the power of the leaves to resist excessive loss. If the water supplying power of the roots of the trees in the three series is equal, then the maintenance of the water balance rests with the leaves. The rate of water loss will depend on the nature of the leaves. Should the leaves produced vary in their power to resist water loss the total area of foliage produced would bear a definite relation to this resisting power as the amount of water lost will determine the amount available for foliage development. Thus it would appear, in the three series of experimental trees described, potassium starvation may reduce the resistance of the leaves to water loss, whilst calcium starvation may increase this resisting power. There is, however, the second possibility that the water supplying power of the roots may be affected by the omissions. It has previously been shown, in the case of apple, that the omission of potassium from the culture solution supplied restricts root development. This restriction is particularly noticeable in the roots of the second and third orders, so that the finer fibrous roots, which constitute the bulk of the absorbing surface, are relatively poorly developed. As a result of this poor root formation the water absorbing power of the root system will be considerably reduced. Thus when potassium is omitted from the culture solution, the water supply to the shoot will be diminished and this fact in itself may account for the smaller size of the leaves produced on the trees in Series M.D. With the advance of the season, when conditions become favourable for more rapid loss of water from the leaves, the supply of water maintained in the potassium starved trees, which may have been just sufficient to support the foliage produced under less extreme conditions, becomes inadequate. The failure of the water supply to the leaves may be followed by the complete drying out of the portions of the leaves, namely the margins and tips, most exposed to drying

influences Chemical changes, which go on in these dried-out portions of the leaf tissue on exposure to a damp atmosphere result in the typical appearance of leaf-scorch (14).

The omission of calcium from the culture solution appeared to have little influence on root development as compared with that of trees receiving a "complete" culture solution. The differences noted, though slightly in favour of the calcium starved trees, seemed much too small to account for large differences in absorbing power. The main factor in preserving the water balance in the trees of the two series would appear to be the resistance of the foliage to water loss.

The observations made on those trees from each series which developed in an orchard house afford additional evidence in support of the views advanced. Throughout the growth period much drier and warmer conditions prevailed in the orchard house than in the open air. Consequently the conditions for rapid loss of water from the leaves were much more severe inside than in the open. The early appearance of leaf-scorch on the trees in Series M.D. (potassium omitted) and its subsequent rapid development shows that the drying conditions favoured its advance. The large difference in the size of the leaves in the two series M.A. and M.F. serves to emphasise the effect of the omission of calcium on the power of the plant to maintain a high water balance.

The "blotching" symptom observed on the leaves of trees in the "complete" and "no calcium" series appeared to be identical with a symptom previously observed (15) on the leaves of apple trees growing in cultures from which magnesium was omitted.

The ratio of potassium to magnesium in the culture solutions employed was high, a condition which has been shown to favour the appearance of this symptom.

EXPERIMENTS ON THE WATER RELATIONS OF GOOSEBERRY BUSHES AND APPLE TREES RECEIVING VARIOUS CULTURE SOLUTIONS.

1. Comparison of the water content of the leaves of gooseberries receiving three culture solutions.

Three samples of shoots, of the current year's growth, were collected from three series of gooseberry bushes in sand cultures as follows:—

One sample from bushes receiving a complete culture solution.

"	"	"	"	"	"	minus potassium.
"	"	"	"	"	"	minus calcium.

The samples were taken in the evening and each sample was placed in a beaker containing distilled water. The three samples were removed to the laboratory and covered with a large bell jar overnight. This procedure was followed in order that the leaves of all the shoots should reach their maximum water content under the same conditions. On the following morning the leaves from all the shoots were removed as rapidly as possible and the three samples quickly weighed. The three weighed samples were dried to constant weight at 98° C. and the water content of each sample was obtained. The results obtained in four experiments are given in Table II.

TABLE II.

THE EFFECT OF THE COMPOSITION OF THE CULTURE SOLUTION
SUPPLIED ON THE WATER CONTENT OF THE LEAVES
OF GOOSEBERRIES IN SAND CULTURES.

Date of Experiment.	Water content of leaves as percentages of fresh weight.		
	Complete culture solution.	Potassium omitted.	Calcium omitted.
20/5/24	76.2	69.8	75.0
21/5/24	74.7	69.2	75.7
27/5/24	70.4	64.9	72.4
14/6/24	70.74	62.44	76.03

The results of the foregoing experiments show that in the case of gooseberry the omission of potassium from the culture solution is reflected in the lower water content of the leaves produced. The omission of calcium seems to favour the maintenance of a higher water content by the leaves.

II. Comparison of the rates of water loss from detached leaves of gooseberries receiving three culture solutions.

To follow more particularly the rate of water loss from gooseberry leaves produced in the three cultures the above experiment was repeated with the following modification. Instead of drying the leaves rapidly at 98° C. the rate of dehydration was followed at a lower temperature. As soon as the detached leaves from the three samples had been weighed they were suspended by the petioles from previously weighed cotton threads. Each sample was weighed at intervals of one hour and the hourly loss of weight was recorded over a total period of seven hours. Preliminary experiments showed that in order to obtain comparable results it was necessary

to allow the leaves to dry out in still air at constant temperature. The samples were therefore suspended in an incubator oven at 25° C.

In the case of gooseberry, when potassium is omitted from the culture solution, the first symptom observed in the foliage is a red colouration. This reddening of the foliage is followed later in the season by the appearance of marginal leaf-scorch on the pigmented leaves. Exactly similar stages have been observed in the field where gooseberries are subject to leaf-scorch.

Experiments were performed as described above at various dates throughout the season. In the tables given below (Table III) the results of two experiments have been summarised. The first experiment was carried out on comparable leaf samples before the red pigmentation of the leaves in the "no potassium" series had appeared. The second experiment was performed later in the season when the red colour of the leaves in this series was well marked but before actual leaf-scorch had appeared.

TABLE III.

THE EFFECT OF THE COMPOSITION OF THE CULTURE SOLUTION
SUPPLIED ON THE RATE OF WATER LOSS FROM DETACHED
LEAVES OF GOOSEBERRIES GROWN IN SAND CULTURES.

Time in hours.	May 21st.—Temperature : 18 C.			June 14th.—Temperature : 25 C.		
	Percentage of Total Water lost from the leaves.			Percentage of Total Water lost from the Leaves.		
	"Complete" solution.	Omitting potassium.	Omitting calcium.	"Complete" solution.	Omitting potassium.	Omitting calcium.
	Leaves : green.			Leaves : pigmented.		
1	12.8	12.6	8.5	34.7	36.8	15.3
2	15.0	16.0	10.5	42.6	51.7	19.7
3	16.7	18.2	11.6	50.8	—	—
4	18.3	20.0	12.5	56.9	70.3	25.9
5	20.3	21.9	13.4	61.2	75.8	28.9
6	22.3	23.7	14.4	64.8	79.8	31.3
7				68.0	83.4	33.4

The results of the two experiments are not strictly comparable as dehydration occurred at different temperatures in the two cases. The results presented, however, indicate that leaves from the bushes receiving no potassium are less able to resist dehydration than leaves from either of the other series. The omission of calcium tends to increase considerably the power of the leaf to resist water

loss. The loss of water from leaves produced in the absence of potassium seems to occur more readily from leaves showing red pigmentation.

It has recently been shown (10) that the absence of potassium or calcium from the plant food may have a considerable influence on the nature of the exposed surfaces of living tissues. The outer walls of the epidermal cells of a leaf are protected by the cuticle which is virtually a vegetable varnish, composed of compounds of calcium, potassium or sodium with complex fat compounds. It has been shown that when potassium is deficient the cuticle is thinner than that formed on leaves from plants receiving a complete culture solution. When calcium is omitted a thicker cuticle is produced than in any other series. It is probable, therefore, that the differences in resistance to dehydration recorded above may be accounted for in part by the difference in the degree of protection afforded by the cuticle in the three samples.

III. Comparison of the transpiring power of the leaves of apple trees receiving three culture solutions.

Transpiration, i.e., the loss of water from a leaf, has been shown to depend, apart from the external factors, on the water content of the leaf and the size of the stomatal openings (8, 9). Loss of water from the leaf which occurs even when the stomata are closed is termed cuticular transpiration and will depend on the nature of the cuticle. Since both the water content of a leaf and the nature of the cuticle are affected by either potassium or calcium starvation it appeared probable that the transpiration rate under these conditions might also be affected.

Using a standardised hygrometric paper method as employed by Livingston (11) and Bakke (1) an attempt was made to compare the rates of transpiration from leaves of the apple trees in the three series. Comparable shoots of the current year's growth were selected from trees of the three series M.A., M.D. and M.F. One shoot from each series bearing seven leaves was supported with the cut end in a tube of distilled water. The transpiration rates of similarly placed leaves on each of the three shoots were compared at intervals of one hour. It was found at the outset that the rate of loss of water from the upper surface of an apple leaf was very slow in comparison with the rate of loss from the lower surface. To obtain comparable results it was necessary to carry out the operations as rapidly as possible on all three shoots, hence determinations were only made on the under surface of the leaves. Each determination was performed in triplicate for each leaf.

The results obtained in these experiments are best presented graphically. In the accompanying figures comparative transpiration rates are plotted against time and observations of the light conditions obtaining during the period of the experiment are also included.

Figures I, and II. (See next page).

Comparison of the transpiring power of the leaves of apple from three series of sand cultures.

— — — : Leaves of trees receiving complete culture solution.

Key. — — — : " " " " " minus potassium.

— : " " " " " minus calcium.

The results of the foregoing experiments, of which those presented in Figs. 1 and 2 are typical, are at present too few to admit of a general interpretation. The results obtained indicate that the rate of transpiration from the potassium starved leaves is lower on the whole than that from leaves of the other two series. This fact may be correlated with the lower water content of these leaves, since it has been shown, that provided the other conditions remain constant, decrease in the water content of the leaf is accompanied by a reduction in the rate of transpiration. When, however, the leaves are brightly illuminated the rate of transpiration from the potassium starved leaves rises rapidly until it exceeds that from the leaves produced in the absence of calcium or in a "complete" culture. It appears therefore, that in bright light the loss of water from potassium starved leaves may be excessive as it is greater than the loss which occurs from leaves having a normally higher water content.

It has been shown that under certain conditions the rate of water loss from a leaf may increase though the water content has fallen slightly below its normal level so that there is actually a water deficit in the leaf. If this high rate of loss is continued then wilting of the leaf, or in severe cases a complete and rapid drying out of those regions of the leaf most exposed to drying conditions, may take place. Wilting of a leaf may occur when the water deficit amounts to less than one per cent. and it seems reasonable to suppose that the danger point would be reached more rapidly in a leaf which has a low water content, such as a leaf from the potassium starved plant, than in a leaf which has a high water content, namely a leaf produced on a tree receiving a complete culture solution or a solution deficient in calcium.

SUMMARY.

- (1) The effects of deficiency of potassium and calcium on the growth and development of young apples trees in sand cultures is described.

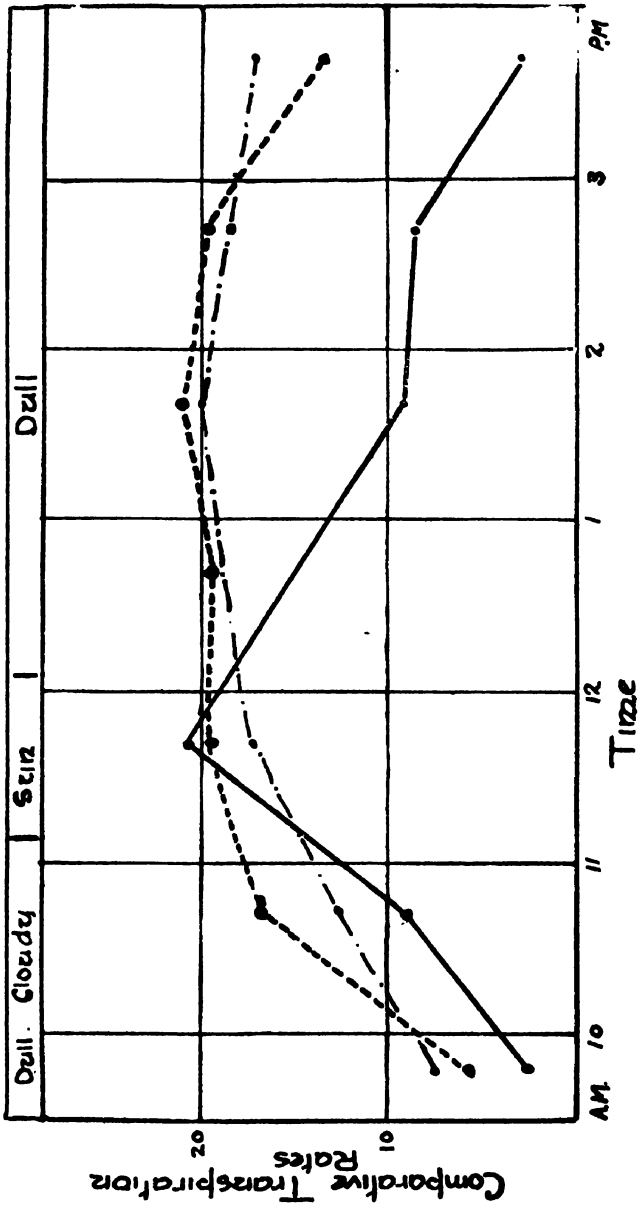


FIG. 1.

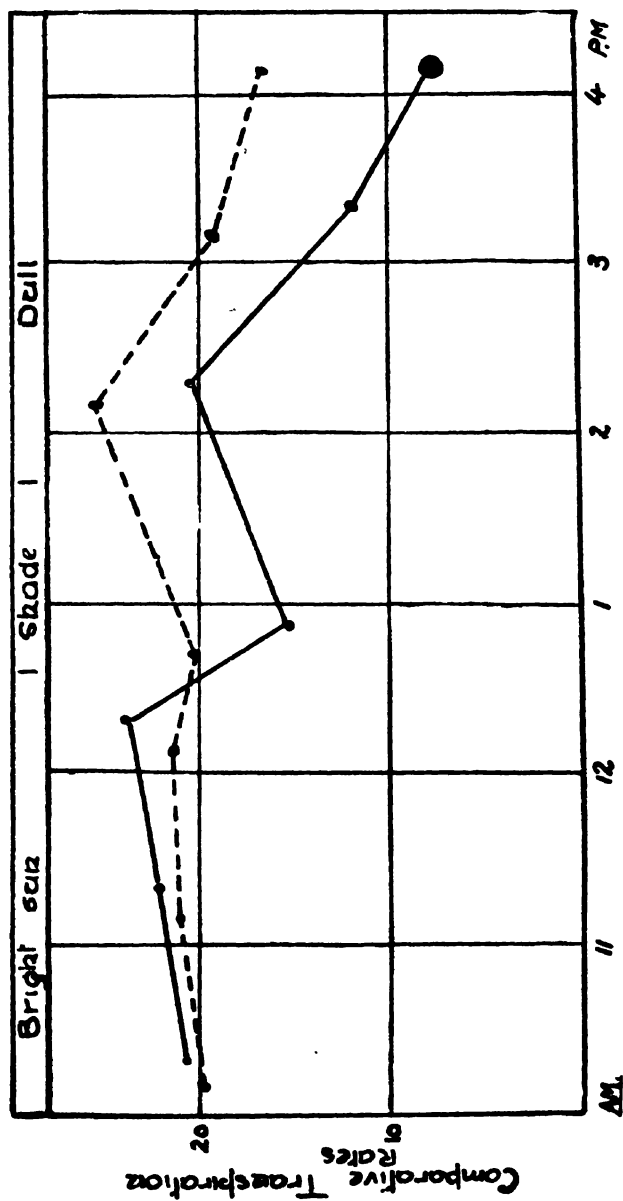


FIG. II.

- (2) When potassium was deficient small leaves were produced which suffered extensively from leaf-scorch.
- (3) When calcium was deficient the leaves produced were considerably larger than those borne on trees which received a "complete" culture solution.
- (4) Experiments on the leaves of gooseberry bushes growing in similar cultures showed :—
 - (a) When potassium was deficient the leaves produced had a lower water-content than the leaves from bushes receiving a "complete" solution whilst when calcium was deficient the water content of the leaves produced was higher than that of leaves in the "complete" series.
 - (b) The power of the leaves to resist water loss was least in the potassium starved leaves and greatest in the calcium starved.
- (5) Preliminary experiments on the comparison of the transpiring power of the leaves of apple trees in sand cultures showed that under dull light conditions the rate of transpiration was lowest in the case of the potassium starved leaves. In bright sunlight the rate of transpiration from these leaves rose rapidly and was generally greater than that of the leaves of the other two series.

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THE TREATMENT OF SEEDLING APPLE TREES TO INDUCE EARLY FRUITING.

(G. T. Spinks.)

One of the difficulties which confronts the breeder of new varieties of apples and other top fruits is the great length of time which usually elapses before a seedling plant begins to bear fruit. A seedling apple tree rarely, if ever, bears any fruit until it is about six years old, and frequently this length of time is prolonged to about ten years.

It is obviously desirable to shorten this period of unfruitfulness as much as possible, and this note is a record of some attempts to do this. Young apple seedlings always exhibit a definite "juvenile" habit of growth differing from the habit of an "adult" tree which has started bearing. Different seedlings naturally show differences in habit, but in general it may be said that they all show the following characters. The branches bear, often on the current year's wood, many lateral shoots, which are either long, thin and whippy, or are short and thin and almost spiny in character. Short lateral growths on the current year's wood are often terminated by thorns instead of buds. The leaves are small and the rosettes surrounding the terminal buds of short lateral growths, "lambourdes" and "dards," consist of few and small leaves which are evidently unable to supply enough nourishment to the bud to convert it into a fruit-bud.

The "juvenile" characters, of course, appear only on *seedling* trees and not on other young trees which consist of a stock on which has been worked a graft or bud taken from an "adult" tree. Apparently a seedling must grow out of its "juvenile" state before it commences to fruit, and the object of the experiments to be described was to find some method of shortening this "juvenile"

period. Obviously an experiment of this sort cannot be conducted with any great accuracy, as all the seedlings used are distinct individuals and behave in different ways. An endeavour was made, however, to obtain some indication of the effect of different methods of treatment on the length of the "juvenile period." The methods adopted were some of those which are known to accelerate fruiting when used on ordinary varieties of apples which have passed out of their juvenile state.

PLAN OF EXPERIMENT.

The experiment was started on March 1st, 1921, by planting out 65 one-year old apple seedlings in the plantation. These trees were grown from seed of unknown parentage and were, in fact, simply a collection of seedlings such as are used as "free" stocks; but those used were all well-grown and as uniform as it was possible to obtain them. They were planted 15 feet apart in three long rows, the distance between the rows also being 15 feet. The trees were divided into groups of five and a different treatment was arranged for each group, as follows :—

- (1) No pruning; no treatment of any sort.
- (2) Shaping.
- (3) Shaping, ringing.
- (4) Shaping, root-pruning.
- (5) Shaping, manuring.
- (6) Shaping, manuring, ringing.
- (7) Shaping, manuring, root-pruning.
- (8) Light pruning.
- (9) Light pruning, ringing.
- (10) Light pruning, root-pruning.
- (11) Light pruning, manuring.
- (12) Light pruning, manuring, ringing.
- (13) Light pruning, manuring, root-pruning.

Some of the above terms need an explanation.

Control.

The trees in group (1) were simply allowed to grow naturally, without pruning or any manurial or other treatment, from the time they were planted as maidens.

Pruning.

"Shaping" indicates that the trees were pruned in Winter for two or three years after planting merely to train them into bush form; no other pruning was given to these trees.

"Light pruning" consisted of the above treatment and, in addition, cutting out inter-crossing branches and strong lateral shoots, and a light tipping of leaders. No spur-pruning was attempted and no Summer pruning was done. No attempt was made to adhere to a rigid plan of pruning, as this would be useless when dealing with seedling trees which have all different characters. It was quite expected that any pruning would delay fruiting, but information was wanted regarding the amount of delay which would result from regulating the shape and size of the trees and the possibility of counteracting this delay by the other treatments given.

Manuring.

A mixture of artificial manures was applied to the trees in groups (5), (6), (7), (11), (12), and (13) in March or April of each year, except immediately after planting. The mixture consisted of sulphate of ammonia, sulphate of potash, and superphosphate in the proportions 2 : 2 : 5, and it was applied at the rate of 9 cwt. of the mixture per acre, *i.e.*, about $3\frac{1}{2}$ oz. per square yard. In 1922, 1 square yard round each tree was treated at this rate, in 1923, 4 square yards, and in 1924, 9 square yards.

Ringing.

The ringed trees were treated as follows:—

On May 16th, 1922, the main stem of each tree was given a ring consisting of a single knife cut extending down to the cambium all the way round the stem.

On July 4th, 1923, the main stem of each tree was again ringed, but in this case two knife cuts were made $\frac{1}{8}$ inch apart and the ring of bark between them was completely removed.

Root-pruning.

The trees to which this treatment had been allotted were root-pruned on November 25th, 1921, and December 18th, 1923, all roots being shortened to 9 to 12 inches on the second occasion.

Other Treatments.

In addition to the 65 trees given in the above list, 10 trees were used as scions for grafting, three scions being obtained from each tree. Ten scions, one from each tree, were head-worked on established bush trees, about 8 years old, which had been headed back. The remaining 20 scions were worked on Malling Type 9 stocks. The only stocks available were some which had only recently been planted, so that the scions had only a poor chance of making good growth.

A further five seedlings were planted in 8 inch pots in March, 1922, that is a year later than all the others, but as they were two years old when planted they are comparable with the other seedlings, which were only one year old when planted. These plants in pots were given liberal dressings each year of the same mixture of manures which was applied in the field, and they were lightly pruned.

DISCUSSION OF RESULTS.

It is not proposed to set out in detail the observations made on the various trees, but merely to give a summary of the results obtained. In October, 1924, when the trees were five years old it was seen that the result of the experiment was largely negative, in so far as up to that time no trees had produced flowers and there would apparently be no buds producing flowers in 1925. Trees in the different groups, however, showed distinct differences which indicated which treatments had favoured the earliest fruiting.

The trees which had been *root-pruned* were on the whole smaller and growing less vigorously than any of the others. But this dwarfing effect had not been accompanied by any formation of flower buds or by any other signs of having reached the "adult" stage. On the contrary, all the trees were distinctly "juvenile" in habit, with the exception of four which showed slight traces of growing out of this condition. It was evident that the root-pruned trees would be the last of all to produce fruit.

The *ringed* trees showed the same characteristics as the root-pruned trees, but in a less marked degree. They were slightly less vigorous than the unringed trees. About six trees were definitely "juvenile" in character, eight were beginning to grow beyond that state, five were almost "adult" in appearance, and one was judged to be definitely "adult."

The trees receiving *no ringing* or *root-pruning* were the most vigorous, and of these three seemed to have reached the "adult" state, eight had nearly reached that state, while seven were still in the "juvenile" stage.

The *manuring* seemed to have produced slightly more vigorous trees, but the increase in vigour was not at all marked. The manured trees, on the average, were also more "adult," but here again the difference was small. On the whole, the more vigorous trees were also the more "adult" in character.

Pruning cannot be said to have had any consistent effect on the character of the trees, and certainly no significant difference between the shaped and pruned trees could be seen. During the short

length of time for which the experiment was carried on it was really only in the last year that there was any inference in the treatment of these two sets of trees. The entirely unpruned trees varied considerably in the degree to which they had reached the "adult" state, and as there were so few of them it cannot be said with certainty that, on the average, they showed more or less of the "adult" character than the pruned trees. On the whole the trees which were manured and lightly pruned, but not otherwise treated, seemed to have made the best progress of any in the experiment, but this may be mere coincidence.

Trees grafted on Type 9 stock made very poor growth and were mostly juvenile in appearance, but they were grafted under such poor conditions that they cannot be said to have had a fair chance. In this connection another set of seedlings worked on dwarfing stocks may be mentioned, though they do not form a part of this experiment. In 1920 several hundred buds from young hybrid apple seedlings were worked on Malling stocks, Types 4, 8 and 9, and in February, 1922, these were planted out here. None of these trees have yet blossomed and very few show any fruit buds for 1925. Trees budded on similar stocks at the same time, the buds for which had been taken from seedlings already in the "adult" state, bore blossom when two years old.

The seedlings *headworked* on older trees have grown vigorously and most of them seem to have reached the "adult" state, but they have not flowered yet and show very few, if any, fruit buds for 1925.

The trees *in pots* are still entirely or partially "juvenile" in character and show no signs of flowering yet.

This experiment has now been concluded, as, although none of the trees have yet come into bearing, it was obvious that the special methods which were being tried were not having the desired effect.

SUMMARY.

From the above results it appears that any treatment which restricts growth, such as ringing, root-pruning, working on dwarfing stocks and growing in pots, does not induce earlier fruiting in very young seedlings. On the contrary it tends to keep the trees longer in a "juvenile" state and so delays fruiting. Probably the best way to obtain early fruiting is to encourage vigorous growth which will bring the tree to its "adult" state at the earliest possible date. When this state has been reached a tree which still refuses to bear can be brought into fruit by some such method as ringing; this method has actually been used with considerable success on "adult" but barren seedlings.

EGG-KILLING WASHES.

(*A. H. Lees, M.A.*)

Winter spraying of fruit trees has been a text book recommendation for a very large number of years, and the advice to do this operation has been given over and over again by those whose business it has been to advise the grower. It may be questioned, however, whether in most cases the giver of the advice had a clear idea of how any particular winter spray fluid worked. In most cases the cleansing of the trunks was emphasised and frequently claims for killing insect eggs were made. No one had, however, so far as the writer is aware, produced any proof of egg-killing powers of any winter wash.

In 1914 the writer referred to the then position of winter spray fluids (1) and certain mixtures were tried which, however, were not successful.

In 1915 (2) further trials were made which showed that hot water was unpracticable, but that, with certain bleaching powder treatments, some success was obtained.

In 1917 and 1919 Peterson (3 and 4) working in U.S.A. published papers showing the effect of various sulphur washes and of crude carbolic acid on the eggs of apple aphids. He found that the higher concentrations of lime sulphur 1 in 6 and 1 in 9, gave good kills and he obtained promising results from the use of crude carbolic acid.

The results with lime sulphur appeared to warrant further trials of this substance in this country and various small trials were done by the writer, using this substance. It was very soon evident however, that sufficiently exact data could not be obtained by any field trial and accordingly, the method of trial on eggs of *Aphis pomi* on pot trees was started. Conditions could thus be much more effectively controlled while still leaving the eggs under an outside environment until hatching started. A few months before this conclusion was reached, Mr. S. P. Wiltshire, at that time Mycologist to the Research Station, brought back from Holland, during the summer of 1921, samples of a Dutch "Carbolineum" which had been giving consistently good results in that country. It was accordingly included in the 1921 trials a year before it was introduced into this country as a commercial article. More recently several British forms of the tar distillate washes have appeared.

The following paper describes the results in the third season of testing egg-killing washes. Especial attention has been paid to the tar-distillate washes frequently sold with the prefix "carbo." An

attempt has been made to form fluids with Cresylic Acid, a substance which in last year's trials gave excellent results. In addition, further tests have been made on Lime-Sulphur with a view of possibly confirming previous years' results.

PROCEDURE.

The eggs selected as a test were again those of the Permanent Apple Aphis. This is the only insect egg that can be obtained in sufficient quantity on a limited space. No other aphid eggs are suitable, as they are always laid in an isolated manner instead of in masses. Apple sucker and caterpillar eggs have a similar disadvantage.

I am much indebted to a well-known nurseryman for obtaining for me, apple plants well infested with eggs in a year in which such material was very difficult to find. These plants were ungrafted stocks of Malling Paradise types 2 and 5. As was to be expected, the type 2 specimens were considerably stronger than the type 5.

When received, the plants were potted up in ordinary potting soil and placed outside.

At various times during the winter, spray fluids were applied by means of a small hand spraying machine.

This work was done in a cold and airy greenhouse. The plants were allowed to dry and then placed outside exposed to all weather conditions. Shortly before hatching began they were taken under cover and placed horizontally over oiled paper.

Most of the young lice fall off under these conditions and are thus easily counted. Those that remained on the plant (as happens when a bud is showing green) were removed and counted. After hatching had finished the plants were cut into convenient lengths and submitted to hot 10% caustic soda for a short time.

This treatment loosened the eggs which were then carefully washed into another vessel and made up to 1,000 c.c. Aliquot portions of the agitated liquid were poured on to a petri dish and the contained eggs counted. The average of six countings gave the number of eggs present. A simple calculation from this gave the total estimated number of eggs on the particular plants.

CONTROLS.

Table 1 gives details of the controls. There were eight of type 5 and five of type 2. The lowest percentage hatch for type 5 was 4.3, the highest 16.1 and the average 10.6. The lowest for type 2 was 15.6, the highest 85.1 and the average 49.7. It is clear from

these figures that the eggs on Type 2 were more viable. It is also clear from a consideration of the number of eggs present in each case that this number had nothing to do with the percentage hatch. Further evidence that the type influenced the percentage hatch is found in Tables 2—5. In these, where a strict comparison of treatments could be made, the average for the two types is shown.

Only in one case, A in Table 3, does type 5 give a higher figure 2.95 over type 2 with 1.03.

It would appear, therefore, from five different series, that the eggs on type 2 were more viable than those on type 5.

It has been pointed out previously that there is no correlation between the number of eggs used and the percentage hatch on the controls and this same absence of correlation can be seen in Tables 2—5.

There would appear therefore, to be only one conclusion, namely, that the stronger stock offered more food to the egg-laying female than the weaker and that in consequence her eggs were more viable.

This conclusion introduces a factor previously overlooked in egg-killing trials and serves to explain some of the discrepancies in the controls observed in previous years. It serves also to emphasise the writer's previous contention that unless an egg-killing wash gives a percentage of hatch of about one it is not likely to be very effective in practice.

LIME SULPHUR.

This fluid gave very encouraging results in the previous year's trials, especially where combined with a spreader. In order to obtain confirmation they were repeated in this year's trials. Three strengths were tried, one volume of concentrate to 15 volumes, one in twenty and one in thirty.

In one series these were combined with 1% calcium caseinate (1lb. per 100 gallons) as a spreader, in the other the lime sulphur was applied alone and each series was done twice, once in December and once in February. Table 2 contains the results. An inspection of the percentage hatch figures clearly shows that no effective egg-killing has been obtained except the 1 in 15 with caseinate done in December. This figure, however, is not supported by those for the other strengths (6.6.7.7). No improvement can be seen as the result of adding caseinate either in December or February. The figures for the December spraying are on the average, very much lower than those for the February spraying, but it would seem easier to attribute this to the influence of the weaker stocks (as shown by the controls) than to the time of application.

TABLE I.

CONTROLS.

Stock.	No. of Eggs Estimated.	Percentage Hatch.
MALLING PARADISE— Type V.	1200	7.5
"	1150	16.1
"	560	3.2
"	693	15.2
"	120	5.5
"	446	13.0
"	616	9.9
"	2300	4.3
Average for Type V.		10.6
Type II.	320	15.6
"	773	48.8
"	983	48.1
"	660	85.1
"	480	50.9
Average for Type II.		49.7

TABLE II.

LIME-SULPHUR.

Stock.	Date of Application.	Strength.	With 1% Ca. Caseinate	No. of Eggs Estimated.	Percentage Hatch.
V.	Dec. 21	1/15	Yes	1193	.92
	"	1/20	"	560	6.6
	"	1/30	"	700	7.7
	"	1/15	No	793	3.3
	"	1/20	"	700	3.4
	"	1/30	"	662	2.3
Average Type V.					3.88
II.	Feb. 29	1/15	Yes.	1283	25.9
	"	1/20	"	1733	35.4
	"	1/30	"	1380	29.5
	"	1/15	No.	480	25.0
	"	1/20	"	1733	53.4
	"	1/30	"	1933	30.2
Average Type II.					33.4
II.	Mar. 4	1/20	1% Sol. Casein	1516	14.0
	"	1/30	" " "	1200	20.7

TABLE III.
TAR DISTILLATES.

Stock	Spray.	Date of Application.	Strength Percentage.	No. of Eggs Estimated.	Percentage Hatch.
V.	B.	Dec. 21	10	1086	0.0
"	"	"	5	733	.4
"	"	"	2½	520	1.7
"	"	"	1	906	2.0
Average Type V. B.					1.03
II.	B.	Feb. 20	10	3300	.6
"	"	"	5	1080	2.98
"	"	"	2½	1233	9.5
"	"	"	1	2416	13.5
Average Type II.					6.63
V.	A. (Old)	Dec. 21	4	340	3.0
"	A. (Fresh)	"	4	1086	3.9
"	" "	"	2	253	2.0
Average Type V. A. (Fresh)					2.95
II.	A. (Fresh)	Feb. 11	4	746	.67
"	" "	"	2	4700	1.4
Average Type II.A. (Fresh)					1.03
V.	C.	Jan. 8	10	2100	0.0
"	"	"	5	1080	.55
"	"	"	2½	1500	3.0
"	"	"	1	70	27.0
II.	D.	" 17	10	2116	.14
"	"	"	5	4066	1.2
"	"	"	2½	880	2.4
"	E.	"	1	1243	12.7
"	"	Feb. 20	10	3066	6.1
"	"	"	5	1120	22.0
"	"	"	2½	1000	27.2
"	"	"	1	3616	39.5

TABLE IV.
CRESYLIC ACID MIXTURES.

Stock.	Mixture.	Percentage Cresylic.	Date of Application.	No. of Eggs Estimated.	Percentage Hatch.
V.	Cresylic, soap	8	Dec. 22	516	14.9
"	" " "	4	"	1016	7.2
"	" " "	2	"	1086	10.5
"	" " "	1	"	870	10.7
"	Cres. soap, casein.	8	"	980	3.2
"	" " "	4	"	640	6.1
"	" " "	2	"	1086	33.5
"	" " "	1	"	713	6.9
Average Type V.					11.6
II.	Cresylic, soap.	8	Feb. 11		16.1
"	" " "	4	"	1633	8.6
"	" " "	2	"	2266	25.2
"	" " "	1	"	276	7.2
"	Cres., soap, casein	8	"	3666	22.1
"	" " " "	4	"	460	47.4
"	" " " "	2	"	563	35.3
"	" " " "	1	"	1766	32.5
Average Type II.					24.6
V.	Cres. soap, Red Oil	4	Dec. 22	633	6.0
"	" " " " "	3	"	460	2.4
"	" " " " "	2	"	1150	3.4
"	" " " " "	1.3	"	320	5.0
II.	" " " " "	4	Feb. 11	270	34.8
"	" " " " "	2.6	"	1366	7.1
"	" " " " "	1.2	"	1283	76.0

TABLE V.
CRESYLIC ACID DUSTS.

Type.	Mixture.					Date of Appli ^c n.	No. of Eggs Estimated.	Percentage Hatch.	
V.	Lime	6gr.,	Cres.	1cc.,	Caseinate	1gr.	Jan. 8	1383	5.8
"	"	12gr.,	"	1cc.,	"	1gr.	"	420	8.8
"	"	24gr.,	"	1cc.,	"	1gr.	"	464	24.8
"	Gr.S.	10gr.,	"	1cc.,	"	1gr.	"	1383	8.7
"	"	20gr.,	"	1cc.,	"	1gr.	"	493	21.6
"	"	40gr.,	"	1cc.,	"	1gr.	"	1346	8.4
Average Type V.									13.0
II.	Lime	6gr.,	Cres.	1cc.,	Caseinate	1gr.	Jan. 17	1100	35.0
"	"	12gr.,	"	1cc.,	"	1gr.	"	260	29.2
"	"	24gr.,	"	1cc.,	"	1gr.	"	3032	13.7
"	Gr.S.	10gr.,	"	1cc.,	Caseinate	1gr.	"	540	15.5
"	"	20gr.,	"	1cc.,	"	1gr.	"	600	9.6
"	"	40gr.,	"	1cc.,	"	1gr.	"	1933	13.7
Average Type II.									19.4
V.	Lime	6gr.,	Cres.	1cc.			Jan. 8	760	8.0
"	"	12gr.,	"	1cc.			"	753	28.4
"	"	24gr.,	"	1cc.			"	413	25.4
"	Gr.S.	10gr.,	"	1cc.			"	626	6.5
"	"	20gr.,	"	1cc.			"	640	12.2
"	"	40gr.,	"	1cc.			"	840	30.7

Cres.=Cresylic Acid. Gr.=Grams. Caseinate=Calcium Caseinate,
Gr.S=Green Sulphur.

Lime sulphur made up with 1% "soluble casein," a proprietary spreader with improved properties, also failed to show definite egg-killing powers.

The difference between the results obtained last season and this as regards lime sulphur are surprising and to the writer unaccountable. It is evident, however, that for the present lime sulphur must be regarded as an unreliable egg-killing wash, and in view of the continued success from tar distillate washes it would be advisable to discontinue its use against insect eggs during the winter except in special instances.

TAR DISTILLATE WASHES.

Since the trials of last year several new washes of British manufacture have appeared on the market. Though these washes are all of a proprietary nature it was thought desirable to obtain some information as to their efficacy as egg-killers. The information does not admit of publication under specific names and accordingly they have been assigned letters. The trials have, however, been fully justified, partly on the score of the many enquiries subsequently answered as to their action, and partly because they have shown that not every such material, though indistinguishable by the eye, has definite egg-killing properties.

In Table 3 will be found the results of these trials. They were designed to test the effect of different strengths and times of application and also of the different brands.

In one case the effect of fresh material was tried against material kept for two years in the laboratory in a half empty but stoppered bottle.

As regards the effect of strengths it is noticeable that in every case, with the exception of A tried in December, the higher strength gave a less percentage hatch than the lower. The divergence in this exception is not marked, and the method may therefore be considered a reliable one and sufficiently accurate to give the difference produced by a 2% difference in strength. The writer claims that no such accuracy can be obtained by field trials.

It was not possible to test early and late spraying except in two instances A and B as supplies of the others did not come to hand in time. At first sight the results from B seemed to suggest that the December application was much more effective than the February.

For each strength a lower percentage hatch was obtained for the December application. A careful consideration of the controls, however, combined with the comparative results set out in Table 2,

and 5 suggest that the real explanation is the smaller viability of the eggs on paradise stock type 5. It was merely a coincidence that the weaker stock was used in the December trials and the stronger in the February ones.

The case of A is suggestive. Here the February results were slightly superior, with an average of 1.03% hatch against 2.95. The effect of the stronger type 2 was here masked presumably by the greater effectiveness of the later spray. It is clear, therefore, that until further trials are made it is impossible to state whether the early or the late spray is the more effective.

Of the five brands tested A—D inclusive gave satisfactory kills for 4% or 5% and 10% strengths, but E was useless at any strength. On type 5, C and B gave almost identical figures while on type 2, D was rather superior to B.

The only case where fresh material was compared with stale (A) there was no material difference.

CRESYLIC ACID MIXTURES.

Small trials from the previous year had shown that commercial Cresylic Acid made up as a very unstable emulsion at strengths of 2½%, 3½% and 5% was very toxic to eggs of a A pomi.

A considerable extended series, Table 4, was tried this year, using this substance boiled up with soap in which it dissolves.

In some trials casein was added as a further emulsifier and in others the soap cresylic was added to commercial "red oil" to test the possibilities of a combined wash, as "red oil" is effective against Woolley Aphis and possibly against Mussel Scab.

None of the mixtures or strengths used, however, gave results justifying commercial usage, though the effect of the two paradise stocks was evident here as in all the other strictly comparable treatments. It was somewhat surprising that so great a strength as 8% cresylic failed to show definite toxic effects, whereas in the previous season's trials 2½% showed a marked one. The only difference between the two trials was that in the first the cresylic acid was loosely held in combination and in the second firmly. It is possible that in this case the soap buffered the action of an otherwise toxic body and suggests that in tar distillate washes the methods of manufacture may be as important as the constitution. It at any rate confirms the view expressed by chemists writing on these washes that the manufacture is a delicate business requiring great care. In the writer's opinion the preparation of such washes by the grower is at present inadvisable.

CRESYLIC ACID DUSTS.

It was thought possible that if commercial cresylic acid was really toxic it might be combined as a dust in order to admit of more easy application than as a spray. Accordingly various trials were made combining the substance with either lime or green sulphur as a carrier and calcium caseinate as a sticker.

The results are given in Table 5. The percentage hatch figures show that in no case were any sticking results obtained and the figures are so erratic that no conclusion can be drawn between different strengths. Here, as elsewhere, the difference between the viability of eggs on types 2 and 5 are disclosed.

SUMMARY AND CONCLUSIONS.

1.—This paper describes the results obtained by the application of certain spray fluids on the eggs of *Aphis Pomi*, the Permanent Apple Aphis.

2.—Both in the controls and in every other comparable case the eggs laid on Malling type 2 stocks proved more viable than those on Malling type 5.

3. Lime Sulphur at all strengths tried with or without calcium caseinate failed to show definite egg-killing power.

4.—Tar distillate washes gave generally good results and the method of testing is accurate enough to show the effect of a difference in strength of wash applied of 2%.

5.—It was not possible to state whether early or late applications of tar distillate washes is the more effective owing to the apparent difference of viability of eggs in the two series.

6.—Commercial cresylic acid, whether made up with soap as a wet spray or with dry carriers as a dust, failed to show egg-killing power.

PLUM APHIS AND BROWN ROT CONTROL.

(*A. H. Lees and H. R. Briton-Jones.*)

INTRODUCTION.

In the constant effort to produce crops of greater quantity and high quality the fruit grower is face to face with the urgent necessity of controlling parasites. These parasites may be entomological and mycological, and it has been the object of applied research to work out methods suitable for the control of all the possible pests and diseases. This work has resulted in a larger number of separate control measures adopted in most cases to particular pests and diseases only and these recommendations can be found in textbooks and similar sources of information. It might

well be asked, however, whether some of these recommendations with their numerous spraying for maladies could ever be carried out without the grower becoming bankrupt in the process and the question becomes more acute still when not one but several maladies have to be controlled at the same time.

The writers feel that the view point already taken by some workers that the proper criterion of disease control is the net profit accruing to the grower is the correct one. The problem is, after all, the grower's and not primarily the plant pathologist's, and there is obviously an economic limit to the number of treatments that a grower can apply to a crop plant no matter how many maladies are affecting it. In extreme cases it may be even more profitable to destroy the crop plant rather than to attempt to control disease by repeated costly treatments. With these considerations the writers have approached the question of control of plum maladies and have endeavoured to find out by the series of experiments about to be described single treatments that would give the highest possible control of the commonest and most important troubles of plum trees in general.

DESCRIPTION OF EXPERIMENT.

It was originally intended to select an orchard where both Aphis and Brown Rot might reasonably be expected to develop. Fortunately sufficient winter moth caterpillar appeared to give data as regards control of this pest also.

Thus the orchard proved to contain the three chief troubles of the plum. The writers are, of course, well aware that other troubles do occur, but they contend that such are not of sufficient frequency to warrant inclusion in a regular spray programme.

The orchard selected for the trial was situated in Gloucestershire and occupied about 7 acres. About one third was interplanted with black currants. The trees were tall half standards of the varieties Victoria and Purple Pershore and, apart from the disease present, were well grown specimens. They had suffered severely from Brown Rot during the previous year and events proved that both aphis and winter moth eggs were present in sufficient numbers to give data on these two pests also.

The plan diagram shows the lay out of the experiments as decided upon in the first instance and the slight modifications which had to be made owing to the danger of injury to an intercrop of black currants in one half of the plantation. The question of intercrops is again referred to overleaf.

PLAN DIAGRAM.

Treatment.	Date of Appli- cation.	Position and Number of Trees.			
		1-12	95-106	191-202	287-298
I. Carbo fluid 7 per cent. . .	31/1/24				
II. Lime Sulphur 1.15 +Ca. Caseinate .2 per cent.	7/3/24	13-24	107-118	203-214	299-310
III. Lime Sulphur 1.30 +Ca. Caseinate .2 per cent.	7/3/24	25-36	119-130	215-226	311-322
IV. Caustic Soda 10 lbs. + Liquid Soap, 3 galls. + Water 100 galls.	3/4/24	37-48	131-142 167-178	227-238	323-334 Not spray- ed. Used as Control
V. Caustic Soda 10 lbs. + Liq. Soap 3 galls. + Paraffin 1 gall. + Water 100 galls.	4/4/24	49-60	143-154	239-250	335-346 Not spray- ed. Used as Control
VI. Caustic Soda 10 lbs. + Liq. Soap 3 galls. + Nicotine 8 ozs. + Water 100 galls.	5/4/24	61-72	155-166	251-262	347-358 Not spray- ed. Used as Control
VII. Control (Untreated) . .		73-84	167-178 (see above)	263-274	359-370
VIII. Carbo fluid 4 per cent. . .	31/1/24	85-94	179-190	275-286	371-378

RESULTS.

The following table shows the results of the spraying in regard to their effectiveness against Aphis, Brown Rot, and Caterpillar damage.

Treatment.	Aphis Control	Brown Rot Control.	Caterpillar Control.
I. 7 per cent. Carbo	Complete	Complete	Fairly good
II. L. S. 1 : 15	Very slight	Slight	Very slight
III. L. S. 1 : 30	do.	Very slight	do.
IV. Caustic + Soap	Complete	Slight	Complete
V. do. + Paraffin	do.	do.	do.
VI. do. + Nicotine	do.	do.	do.
VII. Control	Relatively bad	Relatively bad	Moderately bad
(No treatment)	attack	attack	attack
VIII. 4 per cent. Carbo	Complete	Fairly good	Fairly good

It will be seen that none of the spraying materials used completely controlled Aphis, Brown Rot and Caterpillar. The results which were recorded on 22, 5, 24 can be summarised as follows :—

Lime Sulphur Washes.

Of the two strengths used, the stronger was slightly the better, being a little more effective against Brown Rot. Lime Sulphur partially controlled all three maladies, but it was felt that the benefit derived was not sufficient to justify recommending its use against all or any of the troubles concerned.

Caustic Washes.

The results were the same for all three and as far as could be observed nothing was gained by adding either Nicotine or Paraffin to the Caustic Soda and Soft Soap solution. All three were highly satisfactory against Aphis and Caterpillar, but their action on Brown Rot disease was only slight. The effectiveness of these washes against Aphis and Caterpillar might be due to the fact that they were applied later in the season than the other sprays and killed newly hatched insects.

Carbo fluids.

The higher strength (7 per cent.) completely controlled Aphis and Brown Rot and was also fairly effective against Caterpillar. The lower strength (4 per cent.) gave somewhat similar results except that it was not quite so satisfactory against the Brown Rot. This might be due to the fact that the trees sprayed were

very seriously attacked by Brown Rot in the previous year and it required the stronger concentration under such conditions. The only sign of Brown Rot on trees sprayed with 7 per cent. Carbo fluid were a few pustules which had developed subsequent to spraying on dead twigs killed by the previous year's attack.

DISCUSSION.

The wood killed in the previous year had not been removed and there was a very considerable amount of it on all the trees. The trees were of the standard type and were from twelve to sixteen years old. It has been recommended to cut out all dead branches and twigs as a supplementary measure against Brown Rot. This operation is extremely sound and should always be done in gardens or small plantations. It is felt, however, that it is impracticable in large commercial plantations of fully grown standards trees owing to the difficulty of recognising from the ground the smaller dead twigs and the cost of labour of such an operation, if done when the trees are in a dormant stage.

It is felt that the most satisfactory method of dealing with these three troubles would be to spray first with 7 per cent. Carbo fluid as well as apply grease bands to the tree trunks. These two operations will satisfactorily control all three. Later in the spring when the trees are in leaf the larger dead branches can be more easily recognised and can be removed more effectively, more quickly, and consequently with much less cost in labour to the grower. In subsequent years the application of 4 per cent strength of Carbo fluid, and grease bands would effectively control all three when used on trees which were moderately clean to start with. The use of the weaker strength would almost halve the cost of the spraying fluid which in large plantations would be very considerable. This treatment, though applicable to standard orchards in general, admits of certain exceptions in special cases. Thus in the case of young orchards where straight growth is essential and where for the first few years after planting grease banding is relatively laborious and arsenate spraying relatively easy arsenate can be used for the control of Tortrix moth. In older orchards where straight growth is not so essential, the framework having been formed already, grease banding may be done instead of arsenate spraying. Spraying could be further reduced though at some risk by omitting non-susceptible trees from the yearly programme.

There is a further advantage in using the Carbo fluid, which is applied when the tree is still dormant and when such intercrops as Black Currants, Gooseberries, Red Currants, etc., are also dormant.

In this case there is no danger of any damage to these intercrops. The caustic washes are applied later, just when the plum buds are about to open, at which time there is danger of damage to the intercrops which are then in leaf.

Having come to the conclusion that the Carbo fluid was the most satisfactory remedy, it is intended this year to test out different brands of Carbo fluids at different strengths with a view not only to find out which is the best product on the market but also to strike as nearly as possible the economic balance of cost and efficacy by reducing the strength as far as possible.

In conclusion, we wish to express our indebtedness to Mr. A. McKibbin, of Kents Green, Taynton, Glos., for putting his orchard at our disposal for the trial, and for extending to us his whole-hearted co-operation and hospitality.

PROGRESS REPORT ON RED PLANT OF STRAWBERRIES.

(A. H. Lees and L. N. Staniland.)

In the Annual Report for 1923 Ballard and Peren set out the correlation of Red Plant with Cauliflower Disease. They claimed that the two were manifestations of one and the same disease, the difference being caused by different types of re-action on the part of the plant, and that the infecting organism was the eelworm (*Aphelenchus fragariae*). In their descriptions they state that *A. fragariae* "can usually be found in the growing points of 'Red Plants' and often in the growing point of runners on 'Red Plants.' " They further state that they found it in "Small Leaf" plants, but do not mention its presence in other types nor in normal plants. Subsequent examination on the part of the present writers has shown that in the summer and autumn of 1924 the eelworm could be found in comparatively large numbers in normal plants. These plants appeared perfectly healthy and there was no sign whatever of any resemblance to typical "Red Plant." This discovery made it necessary to revise the current conception of the relation of eelworm to red plant, since it was evident that the mere presence of *A. fragariae* was not sufficient to cause disease. It was clear that not only might different manifestations be produced by different re-actions on the part of the plant, but that even no manifestations at all might follow.

The position was therefore still obscure and it became increasingly obvious that it was necessary to collect further experimental data before observed facts could be explained. As many plants as

possible were examined during the summer and autumn of 1924 and the results are given below.

Facts derived from observation in 1924.

(1) Presence of Eelworm (*A. fragariae*) in normal plants.

Contrary to expectation it was comparatively easy to find eelworms in the leaf bases of normal plants. Such plants have been found in Somerset, Herefordshire, Worcestershire and Hampshire, and may, therefore, be regarded as probably of general distribution.

(2) Position of Eelworm.

From June to the end of September they were found abundantly in the leaf bases. They are found with their heads in the superficial tissue of the inner (upper) surface of the leaf base close to the axil. They could not be found in the mesophyll.

From about the beginning of October till the time of writing (November), they have been found in the growing points, though it is only some growing points of a "Red Plant" that are attacked. Frequently the attack has been intense enough to kill the growing point and thus to cause stimulation of lateral growing points. This would appear to be the first stage—the production of the typical open crown "Red Plants." A further killing out of these lateral growing points may explain the origin of the "patch plant" type. In the summer the growing point is only rarely attacked except in the case of "cauliflower" plants, when the growing point is usually hypertrophied. In normal plants eelworm has not been found in the growing points either in summer or autumn, though at this latter season the numbers in the leaf bases is very much reduced.

Aphelenchus may be found in fair percentage in runners in the summer, but are rarely inside the bud; "cauliflower" runners, however, can and have occurred, but as far as is known these cannot be produced unless eelworm is present near the growing point. First runner plants (*i.e.*, those produced first on a runner) are, on the average, more highly infected than those runner plants produced later; cases have occurred where infection has taken place in the sixth runner plant, this being some distance away from the parent. It is extremely difficult to decide from ordinary observation in the field, whether a runner contains eelworm or not, and it has been found that a careful examination in the laboratory is necessary.

Influence of Moisture on the Eelworm.

It has been observed in the field, both in the strawberry growing districts of the Bristol Province and at Long Ashton, that in those

areas of a strawberry field where there is much waterlogging red plant is more noticeable. The reason for this is not known at present, but eelworm has shown itself to be very susceptible to moisture under laboratory conditions. In cases where plants have been sent in for examination it has often been found that eelworm cannot easily be found unless the plant for examination is kept in a moist atmosphere for some hours. It should be mentioned that the methods used for finding eelworm are as follows. The leaf bases are placed in watch-glasses with a little water and allowed to stand for about five minutes. Eelworm may then be observed free in the water. It is preferable that the leaf bases be washed thoroughly, with the same water into the same watch-glass, by means of a pipette so as to be sure of obtaining the full number of eelworms. To examine a growing point the material is placed on a glass slide with a drop of water and teased apart with needles.

If the plant is not kept for some hours in a bell-jar over a plate containing a little water, it is often found that few eelworms are obtained. A plant fresh from the field does not need to be so treated. The current year has been a very wet one and it is interesting to note that eelworm, and plants suffering from "Red Plant" and "Cauliflower" symptoms, have been exceptionally abundant.

A preliminary experiment has been carried out to ascertain the possible effect of rain on the number of eelworms present in a plant. Seven crowns from bad cases of "Red Plant" were placed in a fine sieve in the bottom of which was a layer of coarse sand an inch deep; the sieve was then placed for half-an-hour in artificial rain, which was comparable to a shower of medium severity. The sand was gently shaken up, a little at a time, with water, which was pipetted off and examined for eelworm as soon as the majority of the sand had settled; in this way all the sand was examined and the number of eelworms washed out of the seven crowns determined. The number was found to be 32, an average of between three and four from each crown. *Aphelenchus* was present as well as other possibly saprophytic kinds.

Assuming that eelworm may be washed out of strawberry plants by rain at any time of the year, it would seem that the rate of production must be sufficiently high to allow for their continuous presence on the plant despite the washing out thus caused. At the end of September the number of eelworms in the outer leaf bases dropped considerably, this being, perhaps, accounted for by assuming that the rate of reproduction has fallen, the washing out of eelworm now producing a definite reduction in numbers. Little, however, is known about of life history, the egg stage not having

been found as yet. From May up to the time of writing (Nov.), individuals of all sizes are constantly found, which suggests constant breeding throughout the period mentioned. It is probable, however, that breeding slackens towards the winter, since fewer are found in the leaf bases. The washing out by rain continued right up to the time of decrease of eelworm in the leaf bases, so that this decrease must mean a slackening in reproduction.

These facts suggest a distribution of eelworm other than that hitherto accepted.

For an explanation of the different manifestations of the disease, other factors must also be investigated. The writers still accept the presence of eelworm as a necessary hypothesis for the moment, but suggest that its presence alone is not sufficient.

It would be premature at this stage to elaborate the various possible factors that may be involved, but trials have been started to test such possibilities as place of infection (leaf base or growing point), amount of dose and the state of the plant, whether strong growing or checked through any cause. It is hoped that these trials may throw some light on the field observations that have been made by the various workers engaged on this problem.

SOME INVESTIGATIONS ON THE BOTTLING OF CIDERS.

(B. T. P. Barker and O. Grove.)

One of the leading features of the modern development of the cider industry is the increased demand for bottled cider. While it is not suggested that the consumption of cider direct from the wood will be entirely displaced, the trade in cider in bottle presents greater commercial opportunities and is, in many respects, more suited to the character of the beverage. As the consumption of cider extends in districts outside the centres of production and as the export trade develops—two features which have already been very marked during recent years—it becomes increasingly evident that the industry will rely very largely on the bottled trade for future progress.

The drawbacks to cider in cask for domestic consumption are familiar. The relatively weak alcoholic strength of the beverage in conjunction with the almost invariable presence of unfermented sugar renders it unstable in character and peculiarly susceptible to various bacterial disorders on access of air. Thus, unless some preservative is used—a practice which is open to obvious objection—deterioration begins to set in as soon as a cask is tapped. That

is a matter of every-day experience : what has not been so generally recognised hitherto, and what the experiments about to be recorded show, is that even when the cask is kept filled and securely bunged deterioration also occurs, although not to the same extent.

Cider in bottle on the other hand is relatively stable. Air is completely excluded and loss of quality due to its action is reduced to a minimum. Bottled cider can thus be kept in the average case for an indefinite time without serious deterioration. On that account it is obviously more suited for domestic use and for purposes where its consumption is irregular.

Notwithstanding the relative stability of cider in bottle, the results are far from consistent, as every bottler knows. Sometimes too heavy a deposit is formed : on other occasions there is little deposit but a considerable development of "fliers," the latter name being commonly used to describe the loose stringy growths composed mainly of aggregates of acetic bacteria. Frequently an excess of gas is produced, leading at times to the bursting of the bottles : at other times the liquor fails to develop the least sparkle. Occasionally the onset of bacterial disorders, *e.g.*, cider sickness, ruins whole batches of bottled stock.

The bottling of ciders, therefore, presents many problems, most of which have hitherto not been closely investigated. The following account of some experiments on the subject conducted during the last few years at Long Ashton will serve to show its vital importance to the cider industry and the necessity of giving serious consideration to the methods of storage of cider in bulk.

Before describing the experiments it may be added that many of the difficulties incident to the practice of bottling cider are avoidable, if pasteurisation after bottling and conditioning is adopted. Recent Reports of the Institute record results fairly satisfactory and reliable for commercial purposes, but the superior quality of a perfectly sound cider naturally conditioned cannot be gainsaid.

The objects of the preliminary investigations were (a) to compare the behaviour and changes in composition of a wide range of ciders of different types after bottling ; (b) to examine the influence of the time of bottling upon subsequent behaviour in bottle, especially in relation to the storage conditions of the cider prior to bottling ; and (c) to trace the nature of the relationship, if any, between the natural rate of fermentation of a cider and the time at which it can be bottled to best advantage.

Information on these points was needed before the problems of bottling could be more closely attacked.

TABLE I.

	Rate of fermentation of juice at 25°C.	Specific Gravity.			
		At milling.	At filtration.	At bottling Mar. 9, 1922.	After 10 months in bottle Jan., 1923.
Backwell Red ..	5.5	1.054 (Oct. 14)	1.031 (Nov. 8)	1.026	1.025
Butter Box ..	4.7	1.055 (Oct. 20)	1.032 (Nov. 15)	1.020	1.019
Crimson King ..	11.0	1.071 (Nov. 22)	1.023 (Jan. 3)	1.016	1.013
New Foxwhelp ..	3.8	1.055 (Oct. 14)	1.035 (Nov. 21)	1.021	1.020
Redstreak ..	2.5	1.050 (Nov. 16)	1.031 (Jan. 4)	1.023	1.022
Kingston Black ..	3.4	1.062 (Nov. 1)	1.035 (Jan. 30)	1.030	1.027
Royal Wilding ..	4.6	1.061 (Nov. 15)	1.034 (Feb. 1)	1.027	1.025
Yarlington Mill ..	3.0	1.048 (Nov. 30)	1.019 (Dec. 29)	1.007	1.007
Broadleaf Norman ..	4.0	1.055 (Nov. 10)	1.020 (Jan. 3)	1.006	1.006
Handsome Norman ..	5.3	1.060 (Nov. 15)	1.028 (Jan. 30)	1.012	1.011
Mixed fruit ..	6.8	1.050 (Oct. 19)	1.030 (Nov. 11)	1.020	1.019

	Acidity. (per cent. as malic acid)			Tannin per cent.		
	At milling	At bottling Mar. 9, 1922.	After 10 months in bottle Jan., 1923.	At milling.	At bottling Mar. 9, 1922.	After 10 months in bottle Jan., 1923.
Backwell Red ..	0.68	0.45	0.42	0.10	0.08	0.08
Butter Box ..	0.72	0.47	0.45	0.12	0.11	0.10
Crimson King ..	0.88	0.76	0.58	0.15	0.15	0.13
New Foxwhelp ..	1.02	0.81	0.67	0.18	0.15	0.15
Redstreak ..	0.49	0.55	0.32	0.13	0.11	0.11
Kingston Black ..	0.55	0.58	0.43	0.19	0.17	0.16
Royal Wilding ..	0.32	0.34	0.32	0.20	0.20	0.20
Yarlington Mill ..	0.30	0.40	0.36	0.25	0.24	0.23
Broadleaf Norman ..	0.36	0.40	0.38	0.22	0.22	0.17
Handsome Norman ..	0.25	0.32	0.30	0.21	0.19	0.17
Mixed fruit ..	0.46	0.39	0.33	0.11	0.11	0.10

	Alcohol precipitate per cent.		Colour index figures.	
	At bottling Mar. 9, 1922	After 10 months in bottle Jan., 1923	At bottling Mar. 9, 1922	After 10 months in bottle Jan., 1923
Backwell Red ..	0.55	0.58	0.6	0.4
Butter Box ..	0.23	0.29	0.6	0.5
Crimson King ..	0.29	0.36	1.0	0.7
New Foxwhelp ..	0.29	0.22	0.9	0.7
Redstreak ..	0.80	0.72	1.1	0.6
Kingston Black ..	0.25	0.24	2.5	2.4
Royal Wilding ..	0.40	0.38	1.9	1.1
Yarlington Mill ..	0.42	0.40	1.3	0.6
Broadleaf Norman ..	0.19	0.28	1.8	0.9
Handsome Norman ..	0.20	0.23	1.5	0.8
Mixed fruit ..	0.42	0.48	1.2	0.7

It may be well at this point to state that the writers' experience in the bottling of ciders, which now extends over many years, has satisfied them that for any given sample of cider there is a point of time for bottling in its life when it will give the best results. If bottled before that point has arrived, the tendency will be for excessive fermentation and deposit in bottle ; if bottling is deferred after that period, the longer the delay in bottling the greater will be the difficulty of developing natural condition in bottle and the more troublesome the development of "fliers." These conclusions apply primarily to straightforward cases of bottling, in which cider taken direct from the cask is used and no preliminary or incidental treatment, such as carbonation, is resorted to, Any special treatment of that kind introduces complicating factors which it is desirable to eliminate in a preliminary investigation. The whole of the work here considered has therefore been conducted with ciders bottled direct from the storage vessel.

A. THE NATURE OF THE CHANGES IN BOTTLED CIDERS.

As a starting point for further study the behaviour of a series of ciders varying widely in character and composition was closely watched for several months after bottling. The ciders selected for observation were made from different varieties of apples during the autumn of 1921 and were bottled in each case on the same date, viz., March 9th, 1922. The following Table I shows the analysis of the freshly pressed juice, the dates of making and filtration and the chemical composition at the time of bottling and at the date of the latest examination at the beginning of January, 1923, some ten months after bottling. It should be stated that no attempt was made in these preliminary tests to secure complete chemical data or to aim at anything closer than approximate accuracy in the determination of the amounts of the various constituents. A more detailed examination in certain directions will be desirable in later stages of the investigations, but the time available during the season's work did not permit of anything more elaborate than the simple routine methods of determination for cider-house purposes being used. These are admittedly open to criticism but suffice to provide the information being sought in the first instance.

Dealing in turn with the respective characters of which estimation was made, the specific gravity change—which represents primarily loss of sugars by fermentation—was in most cases insignificant, a drop of one point only being shown. The *Crimson King*, *Kingston Black* and *Royal Wilding* samples alone showed more

and the maximum of these was limited to a three-points fall. There is little doubt that in the case of Crimson King the high rate of fermentation prior to filtration was associated with the amount of fermentation in bottle, but this does not apply to the other two. The fall in the Kingston Black gravity was accompanied by a relatively large reduction in acidity—from .58 per cent. to .43 per cent.—and, since bacterial action is suspected as being responsible for the latter, it is more than likely it, that rather than alcoholic fermentation by yeasts, caused the major portion of the gravity loss.

The changes in acidity after bottling, as indicated by the titration method, were relatively much more marked. In all cases the total acid content showed diminution. The smaller changes of the order of .03 or .04 per cent., or less, have possibly no special significance. Any tendency to increase by the formation of volatile acids might well be offset by the production of esters. But the larger losses, such as those of .18 per cent. by Crimson King, .23 per cent. by Redstreak, and .15 per cent. by Kingston Black, suggest, as already mentioned for the latter in the previous paragraph, the action of acid-destroying bacteria. In this connection it is interesting to note the changes in acidity between the freshly pressed juices and the ciders at time of bottling. Each of the ciders of relatively high initial acidity, *i.e.*, .6 per cent. and upwards, show considerable diminution of total acid content by the time of bottling. Two of the three ciders with medium initial acidity, *viz.*, Kingston Black and Redstreak, show a slight rise in acidity by that time, the third, made from mixed fruit showing a slight fall. The remainder, of the low-acid-type, show a slight increase over the same period. These indications suggest that the more acid juices are liable under proper conditions for cider-making to suffer more from the action of acid-destroying bacteria than from that of organisms producing volatile acids, *e.g.*, the acetic bacteria, while the reverse applies to low-acid juices.

The "tannin" contents after bottling appear to undergo practically no change that is registered by the method of analysis. The fresh juice in most cases shows a slightly higher amount, the reduction by bottling time being probably attributable to oxidation.

The figures for the alcohol precipitate were obtained by weighing the amount of dried precipitate produced on addition of two volumes of absolute alcohol to one volume of cider. This precipitate consisted mainly of pectic substances. Its amount shows no great or regular difference during the period in bottle, the only noteworthy case being that of Broadleaf Norman, in which there was a rise from .18 to .28 per cent. It would seem, therefore, that some

abnormal change had occurred in the latter, possibly the formation of alcohol-insoluble material from the sugars by the action of micro-organisms.

Reduction in colour of the ciders while in bottle was a regular feature, generally much more marked for low-acid ciders than for those with the higher acidities. The colour-figure indicates the numbers of c.c. of a .01 normal Iodine solution which had to be added to 10 c.c. of water to obtain a similar colour tone as that of the cider when placed in a test tube side by side with the dilute Iodine solution and regarded from above.

The results taken as a whole indicate the difficulty of generalising as to the behaviour of cider in bottle when several weeks elapse between the date of filtration and bottling. The beverage obviously is relatively unstable and subject to abnormal changes which must be attributed to the action of bacteria or other micro-organisms, the extent of such changes being related to the character of the cider. The amount of the normal "secondary" alcoholic fermentation in bottle, for which yeast action is responsible, evidently will be difficult, if not impossible, to determine in the face of these other concurrent changes. While there is no doubt that it is related to both the character of the individual cider and the time of bottling, the results under consideration do not, by themselves and for the reason given, permit of any definite conclusions as to the degree of relationship.

The results recorded in the following part of this paper throw very considerable light on the above on account of the indications given by them of the alteration in character of the cider in storage casks between the filtration and bottling dates.

B. THE INFLUENCE OF THE TIME OF BOTTLING.

General previous experience having indicated that for any given cider the time taken to develop natural condition in bottle, the amount of deposit, and the liability to and extent of development of "fliers" are very closely related to the time of the year at which it is bottled, the investigations under this head were directed towards the behaviour of certain selected ciders when bottled in each case at intervals of a fortnight or longer throughout the bottling period of the cider year. The individual ciders selected were chosen to be representative of the respective types of common occurrence in which the natural rate of fermentation of the juice is more or less widely different.

The definite questions associated with time of bottling which it was attempted to settle in the experiments under this head were :

- (a) The effect of the nature of the storage vessel used for the cider prior to bottling.
- (b) The relation between the natural rate of primary fermentation of a cider and behaviour after bottling.
- (c) The influence of the amount of yeast food other than sugar present in the cider at the time of bottling.

Each of these points had been indicated in previous preparatory studies as having a direct bearing on the nature of the results following bottling at different periods of the year.

(a). The Effect of Storage Conditions prior to Bottling.

Experiments in 1922.

For this test a cider made from a juice with a medium rate of fermentation was selected. The fruit was milled and pressed on November 11th, 1921, the analysis of the juice showing specific gravity 1.066, malic acid .23 per cent., and tannin .14 per cent. It was filtered on January 12th, 1922, at a specific gravity of 1.025. The bottling experiment was started on February 8th, when the specific gravity was 1.021. The cider was divided into three parts. One part, I, was put in a hogshead cask, another part, II, was distributed in 7 small casks, and the third part, III, was stored in 8 large glass jars. In each case the container was completely filled and securely bunged to prevent access of air. At intervals of about a fortnight until mid-April, and thereafter at intervals of one month until August, a certain number of bottles were filled from I, II, and III. In the case of I, immediately after each bottling the remaining bulk of the cider was transferred to a smaller cask, which was filled and then bunged down. In the case of II and III a fresh cask or glass jar of the original sets was used for each bottling. The bottles were kept at cellar temperature.

The bottled ciders were examined in December, 1922. The appended table (Table II.) shows the specific gravity at that time in the different samples.

The most marked result shown by the table overleaf is that while the specific gravity of the ciders bottled from the glass-jars, III, remained very nearly constant no matter what time they were bottled, there was a very appreciable drop in specific gravity in the samples bottled from the large casks, I, and a still more pronounced drop—which also set in earlier—in the case of the samples bottled from the small casks, II.

TABLE II.

Date of bottling.	Specific Gravity, December, 1922;		
	I. From large cask.	II. From small cask.	III. From glass jar.
February 8, 1922 ..	1.018	—	—
" 22, " ..	1.017	1.013	1.017
March 8, " ..	1.016	1.011	1.017
" 24, " ..	1.016	1.011	1.017
April 13, " ..	1.016	1.010	1.017
May 15, " ..	1.013	1.004	1.017
June 12, " ..	1.009	1.001	1.016
July 20, " ..	1.007	1.001	1.015

The specific gravity records taken in this series were unfortunately not sufficient to demonstrate the complete story. As later work has shown, the specific gravity should have been taken in each instance at the time of bottling from the respective storage vessels, so as to show the gravity change in the storage vessel between the start of the experiment and the removal into bottle. It is now known that an important proportion of the gravity fall recorded in this experiment must have occurred before the individual samples were bottled. The results as stated must therefore not be regarded as indicative of the change in gravity after bottling. They represent the total change between the beginning and end of the experiment and include both the fall in the storage vessel and in bottle. It may, however, be stated that any drop in gravity in excess of three points may be taken as having occurred before bottling. The evidence from other series of experiments justifies this statement.

Notwithstanding this omission these results demonstrate the great importance of the kind of storage vessel used prior to bottling. In the glass jars, where the cider was kept without access of air, the cider retained its specific gravity well. In the large casks, where the cider was exposed to the influence of the air through the pores of the wood, the lowering of specific gravity was considerable, and in the case of the small casks, where the surface is much greater in proportion to the volume of liquid, the gravity loss was extreme.

The importance of this point in practical cider-making cannot be over-emphasized. All who have had experience of cellar work are aware of the loss of liquid which occurs by evaporation through the walls of wooden casks. The place of the evaporated liquid is taken largely by air, which clearly is responsible for loss of gravity in the cider, as the above results show, and also for the development of acetification and other disorders produced by bacterial activity encouraged by the presence of oxygen. Individual casks vary

as regards the rate of evaporation, but all wooden vessels, unless specially treated, must be considered as open to serious objection in this connection for cider storage. It is clear that if cider is to be retained as nearly as possible in the condition in which it comes from the filter the sooner it is placed in an air-tight vessel the better. Attention is being given to the question of suitable vessels for the purpose. In this respect the French cider industry has already led the way by the introduction of glass-lined cement tanks, which some of the larger English firms are now also using.

The flavour and general character of the ciders in this series closely followed the specific gravity in the sense that deterioration in quality corresponded with fall in gravity. In fact the rate of gravity loss can very well be taken as indicative of the comparative progress of deterioration in all the series of trials dealt with in this section. The most marked changes in flavour were the hardening due to air effect in the case of the ciders stored in wood before bottling and the loss of aromatic and fruity quality in the same groups. These features were considered independently of changes in sweetness, the extent of which is sufficiently well recorded by the gravity figures, which register mainly the actual sugar loss.

There are two points in connection with flavour changes in bottle to which attention should be called. The first is noticeable only in the case of ciders with relatively high acidity and is remarkable for the development of a taste strongly resembling that of cooked apples. It is accordingly frequently termed the "apple pie" flavour. It was noted throughout the whole series of experiments that this flavour did not develop in every case in the sharper ciders. It occurred very frequently when these ciders had remained in cask for some time after filtration and before bottling. Corresponding samples bottled direct from the filter did not show it, nor did those stored in glass jars between filtration and bottling time. It should, therefore, be attributed to aeration influence, whether by the encouragement of the development of specific organisms or by chemical change only is not at present known. The second point of flavour change to which attention is called is the development of a somewhat disagreeable musty flavour, associated with a corresponding aroma, which occurs more or less regularly when the cider has been in bottle for many months and a considerable amount of yeast deposit is present. It is believed that it is caused by decomposition of the dead yeast cells in the deposit, since samples kept free from standing deposit do not show a corresponding development of this flavour.

In respect of condition, *i.e.*, content of carbon dioxide, the

earlier bottled samples invariably were more highly charged with carbonic acid than those bottled later. This may be taken as a general result in all the bottling investigations, the only cases where it does not apply being those in which cider sickness developed in occasional later bottlings. In such cases the result from the point of view of condition must be considered as abnormal, due to the intervention of the action of the sickness bacillus. At the same time the possibility of the development of the latter is a risk definitely associated with relatively late bottling, as previously pointed out in earlier Reports issued by Long Ashton.

Further in respect of condition in relation to time of bottling, it was obvious in all the series in these trials that the earlier bottled samples came quicker into condition as regards development of carbon dioxide. The later the bottling the slower became the development of condition until ultimately a point was reached where no appreciable amount of gas was formed, even after a prolonged period in bottle.

The influence of temperature on the cider after bottling was tested by placing some of the bottles from the early bottlings at three different temperatures in addition to the cellar-temperature (55°—58° F.), viz., 32°—34° F., 68° F. and 77° F. When tested in December the samples kept at the low temperature showed the same specific gravity as when bottled (1.021), and the cider was completely unaltered and still. The samples kept at higher temperatures (68° F. and 77° F.) showed the same specific gravity (1.017) as the corresponding samples kept at cellar temperature and were practically in the same condition. It would appear, therefore, that except when the bottled cider is stored at a temperature so low that yeast activity is suspended, i.e., near freezing point, or so high that the yeast is injured, it matters little as regards ultimate result on gravity loss what the storage temperature is.

Experiments in 1923.

The foregoing trials, carried out in 1922 were repeated on a more extensive scale in 1923. The details of the latter are included, not so much because of any fundamental new facts which they have revealed as on account of their value in confirming and amplifying the conclusions already stated in connection with the former. There is one point shown by the data given to which attention may be called at this stage, viz., the marked fall in specific gravity shown by nearly all the ciders between the date of filtration and that of the first bottling a few weeks later. Its significance will

be considered when the general conclusions to be drawn from these investigations as a whole are discussed at the end of this paper.

The 1923 trials were carried out with eight ciders made during 1922. On February 17th, 1923, a bottling was made from a 100-gallon cask of each cider, and at the same time 5 glass bottles of a capacity of half a gallon and 5 6-gallon casks were filled from each cask, and the rest of the cider transferred to a 60-gallon cask. Further bottlings were then made as follows :—

- (1) from the 60-gallon cask,
- (2) from one of the glass bottles and
- (3) from one of the small 6-gallon casks

on five successive dates, viz., March 1st, April 4th, May 2nd, June 1st and July 1st, 1923. After each bottling from the 60-gallon casks the casks were filled up with the same cider kept in bottles for the purpose and tightly bunged down.

The ciders used and the results in each case are set out in the following Table (Table III).

In this series of trials detailed chemical analyses were not made at the conclusion of the test, contrary to the usual practice for the experiments of the previous year. The latter had already shown that records showing specific gravity and acidity changes taken in conjunction with the usual sampling tests by taste and eye provided adequate data for the immediate purpose in view at this stage of the investigation. The consequent reduction in analytical work thus enabled a larger number of ciders to be included in the trials and a more general result on the immediate points at issue to be gained.

Taking the first cider, Kingston Black 1, an example of a dry cider, which was filtered on November 27th, 1922, it will be seen from the table that the specific gravity of the samples bottled directly from the filter was 1.012 in December, 1923, whereas the samples bottled in February, 1923, only showed a specific gravity of 1.003. At the same time the first samples had a much better flavour and a smaller deposit in the bottles. The March and April samples did not show any appreciable difference in comparison with the samples bottled in February, but from May onwards the difference was marked, the samples bottled from casks being decidedly inferior to the earlier bottled ones. Those bottled in June and July again were inferior to the May samples. The small cask samples from June and July were very bad and highly acetic. The samples from the glass bottles had kept much better, the specific gravity remained the same, and the May, June and July bottlings were only slightly inferior in flavour to the earlier bottlings from the glass bottles.

TABLE III.

Cider.	Analyses of Juices and Ciders.				
	Specific Gravity.	Acidity, as malic acid. %	Tannin %	Alcohol %	Rate of fermentation at 25°C.
KINGSTON BLACK 1.					
Fresh expressed juice, Nov. 7, 1922	1.045	.46	.12	—	7.5
At filtration, Nov. 27, 1922	1.020	—	—	—	—
At start of bottling test, Feb. 17, 1923	1.005	.51	.12	4.4	—
CAP OF LIBERTY.					
Fresh expressed juice, Nov. 7, 1922..	1.044	.82	.17	—	8.0
At filtration, Nov. 27, 1922.. ..	1.022	—	—	—	—
At start of bottling test, Feb. 17, 1923	1.015	.79	.16	3.2	—
MIXED APPLES.					
Fresh expressed juice, Dec. 6, 1922..	1.012	.39	.22	—	6.3
At filtration, Jan. 25, 1923	1.016	—	—	—	—
At start of bottling test, Feb. 17, 1923	1.010	.41	.20	3.5	—
ROYAL WILDING.					
Fresh expressed juice, Dec. 4, 1922..	1.052	.24	.26	—	6.0
At filtration, Jan. 17, 1923	1.022	—	—	—	—
At start of bottling test, Feb. 17, 1923	1.017	.31	.25	3.8	—
CUMMY NORMAN.					
Fresh expressed juice, Dec. 21, 1922	1.056	.24	.37	—	3.1
At filtration, Jan. 31, 1923	1.023	—	—	—	—
At start of bottling test, Feb. 17, 1923	1.019	.37	.32	4.1	—
EGGLETON STYRE.					
Fresh expressed juice, Dec. 12, 1922	1.065	.36	.20	—	4.6
At filtration, Jan. 25, 1923	1.026	—	—	—	—
At start of bottling test, Feb. 17, 1923	1.020	.30	.16	4.8	—
KINGSTON BLACK 2.					
Fresh expressed juice, Nov. 28, 1922	1.059	.59	.18	—	3.0
At filtration, Jan. 18, 1923	1.025	—	—	—	—
At start of bottling test, Feb. 17, 1923	1.020	.53	.18	4.6	—
LAMBROOK PIPPIN.					
Fresh expressed juice, Dec. 15, 1922	1.042	.54	.20	—	4.0
At filtration, Jan. 9, 1923	1.027	—	—	—	—
At start of bottling test, Feb. 17, 1923	1.022	.56	.19	2.2	—

TABLE III—continued.

Cider.	Analysis of Ciders from bottle 1 samples, December, 1923.			
	Specific Gravity.	Acidity % (as malic acid)	Deposit in bottle.	Flavour.
KINGSTON BLACK 1.				
Sample bottled from bulk direct from the filter, Nov. 27, 1922.				
Specific gravity 1.020	1.011	.30	Very small	Very good
Sample bottled from bulk 82 days after filtration, Feb. 17, 1923				
Specific gravity 1.005	1.003	.46	Small	Good
Sample bottled from large cask				
(a) Mar. 1, 1923	1.003	.49	Some	"
(b) Apr. 4, 1923	1.002	.46	"	"
(c) May 2, 1923	1.001	.48	"	Inferior
(d) June 1, 1923	1.001	.45	"	"
(e) July 1, 1923	1.001	.42	"	"
Sample bottled from small cask				
(a) Mar. 1, 1923	1.004	.53	"	Good
(b) Apr. 4, 1923	1.003	.43	"	"
(c) May 2, 1923	1.002	.43	"	Inferior
(d) June 1, 1923	1.000	.79	Some and "fliers"	Bad, acetic
(e) July 1, 1923	1.001	1.02	"	Bad, very acetic
Sample bottled from glass jar				
(a) Mar. 1, 1923	1.003	.49	Some	Good
(b) Apr. 4, 1923	1.004	.44	"	"
(c) May 2, 1923	1.004	.46	"	Fairly good
(d) June 1, 1923	1.004	.45	"	" "
(e) July 1, 1923	1.004	.46	"	" "
CAP OF LIBERTY.				
Sample bottled from bulk direct from the filter, Nov. 27, 1922				
Specific gravity 1.022	1.020	.62	Small	Very good
Sample bottled from bulk 82 days after filtration, Feb. 17, 1923				
Specific gravity 1.015	1.011	.52	Some	Good
Sample bottled from large cask				
(a) Mar. 1, 1923—	1.010	.45	"	"
(b) Apr. 4, 1923	1.009	.44	"	"
(c) May 2, 1923	1.008	.44	"	"
(d) June 1, 1923	1.006	.44	"	Inferior
(e) July 1, 1923	1.006	.51	Small	"
Sample bottled from small cask				
(a) Mar. 1, 1923	1.009	.48	Some	Good
(b) Apr. 4, 1923	1.009	.56	"	"
(c) May 2, 1923	1.009	.72	Some and "fliers")	Inferior
(d) June 1, 1923	1.004	.86	"	Very inferior, acetic
(e) July 1, 1923	1.003	.78	"	Bad, acetic
Sample bottled from glass jar				
(a) Mar. 1, 1923	1.011	.49	Some	Good
(b) Apr. 4, 1923	1.010	.48	"	"
(c) May 2, 1923	1.010	.45	"	"
(d) June 1, 1923	1.010	.44	Small	Fairly good
(e) July 1, 1923	1.006	.50	"	Inferior.

TABLE III—continued.

Cider.	Analysis of Ciders from bottled samples, December, 1923.			
	Specific Gravity.	Acidity % (as malic acid)	Deposit in bottle.	Flavour.
MIXED APPLES.				
Sample bottled from bulk direct from the filter, Jan; 25, 1923				
Specific gravity 1.016	1.008	.37	Some	Good.
Sample bottled from bulk 23 days after filtration, Feb. 17, 1923				
Specific gravity 1.010	1.006	.36	"	"
Sample bottled from large cask				
(a) Mar. 1, 1923	1.006	.35	"	"
(b) Apr. 4, 1923	1.006	.35	"	"
(c) May 2, 1923	1.005	.36	"	Inferior
(d) June 1, 1923	1.004	.37	"	"
(e) July 1, 1923	1.003	.33	"	"
Sample bottled from small cask				
(a) Mar. 1, 1923	1.006	.32	"	Good
(b) Apr. 4, 1923	1.005	.38	"	Inferior
(c) May 2, 1923	1.004	.40	"	"
(d) June 1, 1923	1.002	.42	"	Very inferior
(e) July 1, 1923	1.002	.97	Some "fliers"	Bad, very acetic
Sample bottled from glass jar				
(a) Mar. 1, 1923	1.006	.34	Some	Good
(b) Apr. 4, 1923	1.006	.35	"	"
(c) May 2, 1923	1.006	.36	"	"
(d) June 1, 1923	1.006	.37	"	"
(e) July 1, 1923	1.006	.37	"	Fairly good
ROYAL WILDING.				
Sample bottled from bulk direct from the filter, Jan. 17, 1923				
Specific gravity 1.022	1.016	.34	Some	Good
Sample bottled from bulk 31 days after filtration, Feb. 17, 1923				
Specific gravity 1.017	1.015	.33	"	"
Sample bottled from large cask				
(a) Mar. 1, 1923	1.014	.33	"	Fairly good
(b) Apr. 4, 1923	1.014	.33	"	"
(c) May 2, 1923	1.012	.31	Small	"
(d) June 1, 1923	1.010	.30	"	Inferior
(e) July 1, 1923	1.009	.31	Very small	"
Sample bottled from small cask				
(a) Mar. 1, 1923	1.014	.37	Some	Fairly good
(b) Apr. 4, 1923	1.012	.36	"	"
(c) May 2, 1923	1.010	.36	Small	"
(d) June 1, 1923	1.008	.53	"	Very inferior
(e) July 1, 1923	1.008	.76	Some "fliers"	Bad, very acetic
Sample bottled from glass jar				
(a) Mar. 1, 1923	1.015	.33	Some	Fairly good
(b) Apr. 4, 1923	1.015	.33	"	Good
(c) May 2, 1923	1.015	.33	Small	"
(d) June 1, 1923	1.015	.34	"	"
(e) July 1, 1923	1.015	.35	"	"

TABLE III—continued.

Cider.	Analysis of Ciders from bottled samples, December 1923.			
	Specific Gravity.	Acidity % (as malic acid).	Deposit in bottle.	Flavour.
CUMMY NORMAN.				
Sample bottled from the bulk direct from the filter, Jan. 29, 1923				
Specific gravity 1.023	1.021	.30	Some	Very good
Sample bottled from bulk 19 days after filtration, Feb. 17, 1923				
Specific gravity 1.019	1.017	.31	"	Good
Sample bottled from large cask				
(a) Mar. 1, 1923	1.016	.31	"	"
(b) Apr. 4, 1923	1.017	.31	"	"
(c) May 2, 1923	1.017	.32	"	"
(d) June 1, 1923	1.015	.31	"	Fairly good
(e) July 1, 1923	1.015	.30	Small	Inferior
Sample bottled from small cask				
(a) Mar. 1, 1923	1.016	.31	Some	Good
(b) Apr. 4, 1923	1.016	.31	"	Inferior
(c) May 2, 1923	1.015	.31	"	"
(d) June 1, 1923	1.012	.65	"	Very infer. acetic
(e) July 1, 1923	1.011	.60	"	"
Sample bottled from glass jar				
(a) Mar. 1, 1923	1.018	.31	"	Good
(b) Apr. 4, 1923	1.018	.29	"	"
(c) May 2, 1923	1.018	.29	"	"
(d) June 1, 1923	1.017	.31	"	"
(e) July 1, 1923	1.015	.30	Small	Fairly good
EGGLETON STYRE.				
Sample bottled from bulk direct from the filter Jan. 25, 1923				
Specific gravity 1.026	1.024	.37	Small	Very good
Sample bottled from bulk 23 days after filtration, Feb. 17, 1923				
Specific gravity 1.020	1.018	.35	"	Good
Sample bottled from large cask				
(a) Mar. 1, 1923	1.018	.40	"	"
(b) Apr. 4, 1923	1.018	.35	"	"
(c) May 2, 1923	1.017	.37	"	Fairly good
(d) June 1, 1923	1.017	.37	"	"
(e) July 1, 1923	1.015	.40	"	"
Sample bottled from small cask				
(a) Mar. 1, 1923	1.017	.42	"	Good
(b) Apr. 4, 1923	1.017	.39	"	Inferior
(c) May 2, 1923	1.017	.44	"	Inferior, acetic
(d) June 1, 1923	1.012	1.01	"	Bad, very acetic
(e) July 1, 1923	1.013	.60	"	Very infer. acetic
Sample bottled from glass jar				
(a) Mar. 1, 1923	1.018	.36	"	Good
(b) Apr. 4, 1923	1.018	.40	"	"
(c) May 2, 1923	1.019	.36	"	Fairly good
(d) June 1, 1923	1.019	.37	"	"
(e) July 1, 1923	1.018	.45	"	"

TABLE III—continued.

Cider,	Analysis of Ciders from bottled samples, December, 1923.			
	Specific Gravity.	Acidity % (as malic acid).	Deposit in bottle.	Flavour.
KINGSTON BLACK 2.				
Sample bottled from bulk direct from the filter, Jan. 18, 1923				
Specific gravity 1.025 ..	1.027	.53	Some	Very good
Sample bottled from bulk 30 days after filtration, Feb. 17, 1923				
Specific gravity 1.020 ..	1.019	.39	"	Good
Sample bottled from large cask				
(a) Mar. 1, 1923 ..	1.020	.30	"	"
(b) Apr. 4, 1923 ..	1.020	.31	"	Fairly good
(c) May 2, 1923 ..	1.019	.29	"	"
(d) June 1, 1923 ..	1.018	.39	Small	Inferior
(e) July 1, 1923 ..	1.017	.41	Small	Very
Sample bottled from small cask			" fliers "	inferior
(a) Mar. 1, 1923 ..	1.020	.32	Some	Good
(b) Apr. 4, 1923 ..	1.020	.33	"	Fairly good
(c) May 2, 1923 ..	1.018	.30	"	Inferior
(d) June 1, 1923 ..	1.014	.33	Small	Very infer.
(e) July 1, 1923 ..	1.015	.70	Small	Bad, very
Sample bottled from glass jar			" fliers "	acetic
(a) Mar. 1, 1923 ..	1.020	.33	Some	Good
(b) Apr. 4, 1923 ..	1.020	.32	"	"
(c) May 2, 1923 ..	1.019	.29	"	"
(d) June 1, 1923 ..	1.019	.28	Very small	"
(e) July 1, 1923 ..	1.019	.30	"	"
LAMBROOK PIPPIN.				
Sample bottled from bulk direct from the filter, Jan. 9, 1923				
Specific gravity 1.027 ..	1.020	.34	Some	Very good
Sample bottled from bulk 39 days after filtration, Feb. 17, 1923				
Specific gravity 1.022 ..	1.018	.33	"	Good
Sample bottled from large cask				
(a) Mar. 1, 1923 ..	1.018	.34	"	"
(b) Apr. 4, 1923 ..	1.018	.33	"	Fairly good
(c) May 2, 1923 ..	1.017	.34	Small	"
(d) June 1, 1923 ..	1.014	.32	Small	"
(e) July 1, 1923 ..	1.012	.41	" fliers "	Inferior
Sample bottled from small cask				
(a) Mar. 1, 1923 ..	1.018	.34	Some	Fairly good
(b) Apr. 4, 1923 ..	1.016	.33	"	Inferior
(c) May 2, 1924 ..	1.012	.34	Small	"
(d) June 1, 1923 ..	1.012	.37	Small	"
(e) July 1, 1923 ..	1.006	.83	" fliers "	Bad, very
Sample bottled from glass jar			" fliers "	acetic
(a) Mar. 1, 1923 ..	1.018	.35	Some	Good
(b) Apr. 4, 1923 ..	1.018	.34	"	"
(c) May 2, 1923 ..	1.017	.34	Small	"
(d) June 1, 1923 ..	1.016	.34	"	"
(e) July 1, 1923 ..	1.017	.33	"	Fairly good

The next two ciders, made from Cap of Liberty and mixed apples respectively and also of the "dry" type, behaved in a similar manner.

The four remaining samples of cider, of the medium-sweet or sweet types in each case, did not vary very much in behaviour. The samples bottled before May kept well as a rule. Samples bottled during May, June and July showed a progressive deterioration when bottled from casks, especially when bottled from small casks, whereas the samples bottled from the large glass bottles did not show a marked difference between early and later bottlings.

(b). *The Influence of the Rate of Fermentation of the Juice.*

Three ciders, viz., A, the one used in the previous series, made from a juice with a medium rate of fermentation, B, made from a rapidly fermenting juice, and C, from a slow fermenting juice, were bottled at the following times: February 8th, March 8th and April 14th, 1922. In each case the samples were bottled from casks, which after the bottling were filled up with some of the same cider and bunged down.

The bottles were kept at cellar temperature and examined in December, 1922, when the specific gravities were as shown in the following Table (Table IV).

TABLE IV.

	Cider A.	Cider B.	Cider C.
Specific gravity before bottling on February 8	1.021	1.021	1.036
Specific gravity of samples bottled February 8	1.018	1.019	1.034
Specific gravity of samples bottled March 8	1.016	1.016	1.033
Specific gravity of samples bottled April 14	1.016	1.015	1.033

In these cases the drop in specific gravity was not excessive; it was least in the case of C, the sample with a slow rate of fermentation, where it was rather low. The amount of gas which was formed was just enough to make the cider nicely sparkling when poured from the bottle. The flavour of the cider in all three cases showed, however, a decided superiority for the samples bottled on February 8th in comparison with those bottled on March 8th, and the latter were in turn superior to the samples bottled on April 14th.

A temperature test was made in this series also. Samples of the bottled ciders were kept at 32°—34° F., 68° F. and 77° F.

with the same result as in the preceding series, viz., that the ciders had kept quite unaltered at the low temperature and that the influence of the higher temperature upon the rate of fall in specific gravity was not considerable.

The results for gravity loss in this series were less striking than had been anticipated in view of previous experience. Discussion of their significance may be deferred until those with the two following series have been described, for the latter throw some light upon them.

In the next series, designed to show the effects of blending ciders of different rates of fermentation, the two ciders B (quick fermenting) and C (slow fermenting) were blended in equal parts and bottles were filled from cask on February 8th, March 8th and April 14th, as above.

When examined in December the specific gravities were as shown in the following Table (Table V).

TABLE V.

			Blend B. + C.
Sample bottled	February 8	..	1.027
"	" March 8	..	1.027
"	" April 14	..	1.025

(c). *The Influence of Yeast Nutrients other than Sugars.*

In a further series, to ascertain the influence of the amount of yeast food present, to three sets of samples of the slow fermenting cider C was added phosphate of ammonia in varying quantities to increase the rate of fermentation by introducing this nitrogenous yeast food. These were bottled on February 8th at a gravity of 1.036. In December the gravities were as shown in the following Table (Table VI).

TABLE VI.

	Cider C.
Small dose of phosphate of ammonia (5 in 100,000)..	.. 1.029
Medium dose of phosphate of ammonia (10 in 100,000)	.. 1.025
Large dose of phosphate of ammonia (20 in 100,000)..	.. 1.020

These sets of gravity records shown by Tables V and VI taken in conjunction with the preceding are illuminating. In the first place the result of blending B and C was a loss of gravity materially less than that occurring in B alone and even slightly less than in C alone, although in the latter instance no stress should be laid on the difference since it is no more than may occur at any time

between one set and another of samples of the same cider. In the second place the addition of nitrogenous yeast food to C resulted in a material increase in loss of gravity in all cases, the amount in each instance being in direct relation to the quantity of food added. The fermentation in bottle in the latter set was so strong that a large proportion of the bottles burst.

Taking the results in all the three series in sections (b) and (c) together it seems clear that for this particular cider season the residual amount of nitrogenous yeast food left in the individual ciders at the time of bottling was so small in all cases that yeast action in bottle was reduced to a point where pronounced differences in results were impossible. In other words yeast starvation was extreme throughout. The minor differences noted were just sufficient to indicate initial differences in the original juices in respect of natural rate of fermentation, but no more. A more decisive result could only have been obtained by starting the trials earlier than February, before yeast exhaustion had become so pronounced. This view is supported by the behaviour of individual ciders bottled as samples year after year in the course of the normal variety trial work in the cider-house at the Institute. These samples are bottled direct from the filter at whatever period of the season the particular cider in question may reach the stage at which filtration is decided upon. Some are bottled early, others later. Some are of the rapid fermenting type, others of the slow fermenting group. While the gravity fall in bottle differs considerably in individual cases, the general experience is that an appreciably greater fall in gravity occurs when filtration and bottling are done relatively early in the life of a cider than when these operations are deferred until the cider is older. In making this statement a qualifying clause should be added with reference to the amount of fermentable sugar present at the time of filtration and bottling. While the actual amount does not appear to affect the results materially provided that an adequate quantity is present, it is obvious that when the quantity is very small the results may be abnormal because of exhaustion of sugar.

The question of the amount of assimilable nitrogen in the cider is clearly of first importance in deciding the subsequent behaviour of the cider in bottle. All records taken in connection with this work go to show, however, that there is little residual material of this kind left after filtration and hence in the average case the drop in gravity of cider in bottle after many months storage is rarely in excess of three points. The point is one of considerable significance as indicating the extent to which the crop of yeast

produced during the primary fermentation of the expressed juice removes the greater part of the original nitrogen content. The result in an extreme case may be quoted. Some Bramley's Seedling apples were milled and pressed on December 12th, 1921, and filtered nine days later on December 21st, when the specific gravity was 1.038. Samples were bottled direct from the filter. The specific gravity of these samples at the time of writing, more than four years later, is 1.034, a drop of only four points having occurred during that period. The original rate of fermentation of the juice was over 14, an excessively high one. The original yeast crop thus in this case must have removed almost the whole of the assimilable nitrogen with the result that, in spite of the very early bottling, very little more fermentation occurred in bottle than in the average case.

(d). The Nature of the Deposit in Bottled Ciders.

The behaviour of different ciders of similar age varies considerably as regards amount of deposit formed after bottling at any given date. While some idea as to extent of deposit can be deduced from knowledge of the following factors, (a) condition of ripeness of the fruit at the time of milling, (b) the chemical composition and rate of fermentation of the juice, and (c) the age of the cider at filtration and at bottling, a forecast of the result cannot at present be made with certainty.

The nature of the deposit is complex and it is for that reason that the behaviour of different ciders is so variable. The chief constituents are yeast cells, bacteria, remnants of the cellular tissue of the fruit, and insoluble substances, generally mainly pectin derivatives, settling out during storage in a bottle. The proportions of these differ according to the character of the fruit and the history of the cider. The following generalisations may be made.

The amount of yeast deposit is associated with and more or less in proportion to the quantity of available nitrogenous yeast food in the bottled cider.

The number of bacteria is relatively small in a perfectly sound cider, but is largely increased if any of the bacterial disorders develop after bottling. The relation of the latter to the deposit question has been considered in previous papers dealing with the individual disorders and the only case requiring special notice here is that of the acetic bacteria. These are mainly responsible for the formation of "fliers," especially in association with threads of filter pulp which are generally to be found in filtered ciders in very small amount. The development of acetic bacteria

is contingent on the presence of oxygen in the bottle, either dissolved in the cider or in the air space between cork and liquid. There is a contest between the yeasts and bacteria for the available oxygen and the result is decided by the amount of oxygen present in relation to the relative capacity of the two groups of organisms. The chances of the yeasts, which are the dominant group when adequately nourished, are determined by the quantity of nitrogenous yeast food available. This, as previously shown, is decided by the interaction of several factors concerned with the fruit, and the history and age of the cider. The degree of risk of the development of "fliers" in a sample of bottled cider could probably be expressed by the ratio of available oxygen to nitrogenous yeast food.

The insoluble matter deposited from bottled cider during storage consists mainly of pectin derivatives which settle out in loose and flocculent form. Most of this material is thrown out during the fermentation of the juice and in the early life of the cider. The age of the cider at the time of bottling is thus important in this connection. The other factor which can be definitely associated with the results is the acidity. Low-acid ciders, especially those with less than .4 per cent. malic acid, are much more commonly subject to this type of deposit than those of higher acidity.

CONCLUSIONS.

Reviewing the results in the experiments described the following points appear definitely outstanding.

1. With the eleven ciders of widely different character in respect of chemical composition and initial rate of fermentation of the original juice, all bottled early in March, 1922, at specific gravities ranging from standards appropriate for dry to those for sweet ciders, the loss in gravity after ten months in bottle was in all cases trifling. The age of these ciders at the time of bottling varied from about three-and-a-half months to five months.

In all cases sufficient fermentation in bottle had occurred to bring the cider into adequate sparkling condition. Where the fall in gravity exceeded one point, the quantity of gas present was in excess of requirement.

Acidity changes in bottle, while in all cases showing a reduction, varied materially in individual ciders. The differences are attributed largely to the action of acid-destroying bacteria in varying degree, a complicating factor upsetting any close estimation of normal acidity change.

2. The behaviour of a cider from the time of filtration onwards varies to an extraordinary degree according to the conditions of storage to which it is subjected. The important factor determining storage changes appears to be aeration. Storage in wood results in material and long-continued loss of gravity, even when the casks are kept filled and tightly bunged. Storage in bottle or in larger gas-tight vessels prevents any marked gravity change in filtered ciders older than three or four months.

Transfer of a cider from large air-tight containers to bottles at any stage subsequent to three or four months after making can apparently be accomplished without serious alteration in result or much risk of stimulation of secondary bacterial disturbance. On the other hand, transfer from the wood to bottle as the cider ages is liable to be followed by bacterial trouble, the risk and extent of which seems to increase during the summer following the making in proportion to the age of the cider at the time of bottling. The aeration factor must also be taken into account. Its action is probably complex, appearing to be part due to stimulative effect on the partially starved yeast cells and in part to the encouragement to growth of bacteria which may lead to the production of suitable nitrogenous yeast food from constituents of the cider unassimilable by the yeasts in their original form. The evidence available suggests both modes of action, but further research on this part of the subject is needed before conclusions can be established.

3. The very slight gravity fall in filtered ciders three months old and upwards stored in air-tight containers is due primarily to deficiency of suitable nitrogenous yeast food.
4. The amount of deposit in bottle resulting from bottling in February and onwards can be approximately correlated with the age of the cider and the time of bottling for any individual cider. Bottling earlier than February direct from the filter gives deposit results of a variable nature: with some ciders the quantity of deposit has been less and with others more in the earlier bottling than in the February.

The work, to the point carried in this paper, has considerably clarified the position with regard to the problems of bottling cider under the system of natural conditioning. A fall in specific gravity of one or two points in bottle is sufficient to charge the liquor with an adequate amount of carbon dioxide to produce good sparkling condition. A larger fall results in too gaseous a state and too much

deposit. The extent of gravity fall in bottle is determined by the age and character of the cider and is directly connected with the content of nitrogenous yeast food at the time of bottling. After active fermentation has been arrested and clearing accomplished by filtration or other corresponding means—the stage at which the greater part of the original nitrogenous yeast food has been removed by the primary yeast crop—the critical period in the life of the cider, when access of oxygen is definitely detrimental on account of accompanying bacterial activity, is reached. Cider destined for bottling should be bottled without delay then, if the residual nitrogen content is not too high: if so high that excessive fermentation in bottle will follow, storage in an air-proof vessel should be given until the excess fermentation is exhausted. There are no simple means yet available for direct nitrogen determinations, nor is it known at present what content of nitrogen should be aimed at. The next stage of the investigation will be largely concerned with this aspect of the subject. It is obvious that the inherent difficulties indicated could be overcome by the adoption of a system of disgorging in connection with bottling practice, but such methods at present are rather beyond the range of the average maker. Hence, in this investigation attention has so far been directed to the elucidation of the principles affecting bottling, leaving the study of special methods to subsequent work.

CIDER MAKING TRIALS FOR THE SEASON 1923-24.

(O. Grove.)

The 1923 crop of cider apples was a small one and the unsatisfactory weather during the ripening period, together with the wet state of the orchards during the harvest, which made it very difficult to collect and store the apples in sound condition, did not make for a good cider year. The ciders made were consequently on the whole not particularly good; this was especially the case with the samples of the sharp varieties. In the bitter-sweet group the adverse season did not seem to have so much influence and several of the samples were very good. The average specific gravity of all the juices was fair, namely, 1.0518.

In the following tables will be found a list of ciders as exhibited for sampling on tasting day, the 15th July, 1924. It will be seen that the list includes some samples made from sharp varieties during the 1922 season for comparison, and the general opinion at the tasting was that they were in many cases superior to the 1923 samples of the same group.

No.	Name of Variety.	District where Grown.	Date of Making.	Specific Gravity of Fresh Juice.	Male Acid per cent.	Tannin per cent.	Rate of fermentation at 25°C.	Date of Filtering.	Specific Gravity, July, 1924.
APPLES—									
SHARP VARIETIES.									
1	Lambrook Pippin (1923)	..	Martock, Som.	..	..	..	..	18/3/24	1.0201
2	" " " "	..	" "	..	..	..	3.6	18/3/24	1.0222
3	" " " "	..	" "	..	..	..	3.8	27/2/24	1.0193
4	" " " (1922)	..	" "	..	..	..	4.5	9/1/23	1.018
5	Foxwhelp (1923)	..	Nunnington, Her.	..	..	..	4.0	22/12/23	1.017
6	" " " (1922)	..	Withington, Her.	..	..	..	5.4	4/12/22	1.018
7	" " " "	..	Yatton, Som.	..	..	..	6.6	28/12/22	1.019
8	" " " "	..	Credenhill, Her.	..	..	..	3.2	12/12/22	1.020
9	Red Streak (1923)	..	Breinton, Her.	..	..	..	3.8	22/11/23	1.022
10	Kingston Black (1923)	..	Nunnington, Her.	..	..	..	5.0	18/12/23	1.023
11	" " " "	..	Moorhampton, Her.	..	..	..	7.1	12/1/24	1.029
12	" " " "	..	Martock, Som.	..	..	..	8.2	6/1/24	1.029
13	" " " "	..	Mtchelney, Som.	..	..	..	6.0	5/1/24	1.029
14	" " " (1922)	..	Credenhill, Her.	..	..	..	7.0	20/1/23	1.019
15	" " " "	..	Kingweston, Som.	..	..	..	2.7	6/1/23	1.020
16	" " " "	..	Spetchley, Worcs.	..	..	..	3.1	22/1/23	1.021
17	" " " "	..	Withington, Her.	..	..	..	3.0	18/1/23	1.023
18	" " " "	..	Hele, Devon	..	..	..	2.5	3/2/23	1.024
19	" " " "	..	Congresbury, Som.	..	..	..	4.8	30/12/22	1.024
20	" " " "	..	Ledbury, Her.	..	..	..	3.1	3/2/23	1.020
21	" " " "	..	Hereford	..	..	..	2.6	26/2/23	1.0194
22	" " " "	..	" "	..	..	..	0.19	12/3/23	1.0225

SHARP VARIETIES.—*Contd.*

23	Cap of Liberty (1923)	..	Nunnington, Her.	..	6/11/23	1.056	0.74	0.23	5.5	19/11/23	1.026
24	"	..	Martock Som.	..	21/11/23	1.054	0.75	0.19	5.0	24/12/23	1.023
25	"	..	"	..	7/12/23	1.054	0.71	0.18	5.0	19/1/24	1.023
26	"	..	"	..	12/11/23	1.050	0.76	0.20	4.0	1/1/24	1.029
27	"	..	Muchelney, Som.	..	23/11/22	1.051	0.95	0.21	3.0	15/12/23	1.032
28	Spice Apple (1922)	..	Martock, Som.	..	15/12/23	1.042	0.83	0.17	3.0	2/1/23	1.022
29	Crimson King (1922)	..	North Cadbury, Som.	..	21/11/22	1.044	0.64	0.17	4.1	21/11/22	1.022
30	Tom Putt (1922)	..	Chard, Som.	..	16/11/22	1.048	0.68	0.15	6.0	6/12/22	1.027
31	Goose Apple (1922)	..	Ledbury, Her.	..	11/11/22	1.045	0.60	0.17	3.3	15/12/22	1.028
		..	Hereford	..							

BITTERSWEET VARIETIES—

32	Strawberry Norman (1923)	..	Hereford	..	15/11/23	1.057	0.34	0.35	9.7	18/12/23	0.016
33	"	..	Breinton, Her.	..	1/11/23	1.058	0.37	0.32	8.0	23/11/23	1.019
34	Argle Grise	..	Byford, Her.	..	15/11/23	1.048	0.18	0.18	6.8	17/12/23	1.019
35	Bramtot	..	"	..	15/11/23	1.052	0.20	0.27	6.4	2/1/24	1.018
36	White Jersey	..	"	..	2/11/23	1.058	0.35	0.25	9.6	12/11/23	0.017
37	White Norman	..	Moorhampton, Her.	..	5/11/23	1.052	0.42	0.20	9.2	26/11/23	1.020
38	Cummy Norman	..	Nunnington, Her.	..	9/11/23	1.060	0.27	0.19	12.0	4/12/23	1.021
39	Frequin Audievre	..	Hereford	..	15/11/23	1.053	0.17	0.28	7.4	17/12/23	1.022
40	Royal Jersey	..	Byford, Her.	..	12/11/23	1.056	0.17	0.25	4.0	18/2/24	1.026
		..	Martock	..							

MIXED APPLES—

41	Mixed Apples	..	Nunnington, Her.	..	6/11/23	1.054	0.64	0.17	8.0	4/12/24	1.0186
42	"	..	"	..	6/11/23	1.054	0.64	0.17	8.0		1.0117
43	"	..	"	..	6/11/23	1.054	0.64	0.17	8.0		1.0138
44	"	..	"	..	7/12/23	1.055	0.39	0.20	6.0	14/1/24	1.0169
45	"	..	Martock, Som.	..	7/12/23	1.055	0.39	0.20	6.0		1.00610
46	"	..	"	..	7/12/23	1.055	0.39	0.20	6.0		1.00211
47	"	..	"	..	7/12/23	1.055	0.39	0.20	6.0		1.02112
		..	"	..							

Taking the individual samples, the first three were made from Lambrook Pippin apples received at Long Ashton on November 30th, 1923, and made up on January 7th, 1924. Upon arrival the apples were divided into three lots, No. 1 was stored in bins under cover, No 2 in bins in the open and No 3 in sacks under cover. In the bins the height of the apples was about 2 feet. As the result of the different methods of storage it was found that Nos. 1 and 2 were very similar both as regards the chemical composition of the juice, the rate of fermentation and the general character of the cider ; the two samples being very similar. No. 3 was, however, decidedly inferior ; the juice had a lower specific gravity (representing loss of sugar during storage), a lower acid and tannin content and a higher rate of fermentation. The storing of apples in sacks for more than a few days has a bad influence upon the apples and the resulting cider. It is always preferable to get them out in bins as soon as possible.

The Foxwhelp (1923) was only fairly good, the condition of the apples when received was not satisfactory. The Redstreak (1923) was fair, although not so good as earlier samples of this variety. In the case of all the Kingston Black ciders the condition of the apples when received was not good ; they were all past the best stage for cider making. Nos. 12 and 13 were the best, but the 1922 samples were generally considered superior. The same was the case with the Cap of Libertys . here also the 1923 samples were made from over ripe apples.

The bitter-sweet group contained some of the best samples of the season. They were upon the whole of good quality, especially the three French varieties, Argile grise, Bramtôt and Frequin Audièvre, which were very nice ciders with a fine soft flavour and fruity aroma.

Ciders were made from many different lots of mixed apples, of which two were exhibited on the tasting day for comparison as to the effect of filtering and racking.

The juices in Ncs. 47, 48 and 49 had all been pasteurised by heating to 158° Fah. in an open steam pan. This is evidently an unsatisfactory way since the exposure to the air during the heating is very liable to give the juice a cooked flavour. In pasteurisation experiments in progress at present the juices have been pasteurised, directly after pressing, by passing them through a pasteurising apparatus of French manufacture, which is constructed in such a way that the juice during the pasteurisation process passes through a set of tubes and does not get exposed to the air before it is completely cooled in the apparatus. This apparatus is giving very promising results and the difference in flavour between juices before and after pasteurisation is negligible.

SULPHUR DIOXIDE AS A PRESERVATIVE FOR FRUIT.

(B. T. P. Barker and O. Grove.)

Sulphur dioxide (SO_2), the gas formed when sulphur burns in the air, possesses antiseptic properties which have been known and used for practical purposes almost from time immemorial. It has been utilised extensively for hundreds of years in the wine industry, especially for white wines, and nearly all the French white wines are treated with it at the present day. This is partly done to check fermentation and partly to prevent the development of micro-organisms causing disorder in the wines. For this purpose the dosage is generally applied in the form of gas produced by burning sulphur in the casks, or in solid form combined with a base, such as potassium meta-bisulphite and bisulphite of lime. Lately it has also been used in the liquid form, the gas being condensed under pressure into a liquid. This form is preferable, since it permits of using exact weighed amounts.

Its use as a preservative is frequent also in the case of other fermented or fermentable beverages, such as beer, cider and various non-alcoholic sweetened liquors. Custom has sanctioned the practice as legitimate and experience has proved that its effects on the human system are not harmful provided that the dosage is not permitted to exceed certain limits of free sulphur dioxide.

Various articles of food can be preserved from decomposition by it. It has been found of particular service in the case of fruit and its use for fruit preservation forms the subject of this paper.

Its special value in this connection is its volatility. If, for example, fruit is preserved by immersion in a dilute aqueous solution of the gas, it can be freed from the preservative when required for consumption by the simple expedient of boiling, the gas being rapidly driven off at the temperature of boiling water.

In modern times it has played an important part in the jam-making industry as a preservative for fruit pulp. The latter article, while unsuited for the production of the highest class of preserves, is nevertheless a commodity of a distinctly useful order in particular cases for the manufacture of a cheap, wholesome jam, provided that it has been well preserved. It enables the manufacturer to handle a much larger quantity of fruit in glut seasons than he could otherwise do, since, by converting into pulp the part of the crop which it is impossible for him to make up into jam during the fresh fruit season he can put it aside in store until pressure of work in the factory has slackened.

During the course of the war the present writers were closely concerned with the manufacture of a considerable quantity of fruit pulp and their experience with the product, while illustrating its value from the different points of view of the fruit grower and the jam boiler, demonstrated also inherent difficulties in its preservation in satisfactory form. When large quantities are made, storage in wooden casks is adopted. Since these are not absolutely air-tight and sulphur dioxide is both volatile and readily oxidisable, the dose of preservative added as adequate in the first instance becomes in course of time reduced below the toxic limit for the reasons just stated. If, when that time is reached, it is necessary to carry the fruit over a further period of storage, a supplementary dose of the preservative must be added. Otherwise, as not infrequently has occurred, moulds, yeasts, and bacteria begin to invade the pulp and it becomes worthless. Thus, by the time some pulps are used, the total quantity of preservative added may be relatively considerable and, although little may remain in the pulp as such, there is an appreciable amount of free or combined sulphuric acid left, resulting from the oxidation of the non-volatilised part of the sulphur dioxide.

For these reasons the writers turned their attention to the general question of the preservation of fruit by sulphur dioxide with the object of discovering, if possible, an alternative method to pulping which should not be open to the objection of the use of a relatively large quantity of preservative. The method of preservation herein described is the outcome.

The objects of the experiments were to ascertain (a) the smallest possible dose of sulphur dioxide which must be added to fruit in the first instance to inhibit the development of moulds, yeasts and bacteria, (b) the conditions under which such preserved fruit should be stored to render, if possible, further addition to the preservative unnecessary, (c) the effect of the preservative on the fruit itself and (d) the possible uses other than jam-making to which fruit so preserved could be put.

A. Dosage of Sulphur Dioxide required for Preservative Effect.

The earlier series of experiments were concerned primarily with this point. For obtaining accurate results it was clear that precautions were necessary in respect of possible diminution in the amount of sulphur dioxide actually available for preservative purposes by (a) evaporation, (b) oxidation, and (c) combination with constituents of the fruit. The experiments were therefore made under the following conditions.

The fruit selected for trial, in all cases used as soon as possible after being picked and in perfectly sound condition, was packed in glass jars fitted with lids for hermetical sealing, such as are commonly utilised for fruit bottling. The preservative solutions to be tested were then simply poured over the fruit, the latter being completely immersed and the jar filled with the solution so as to leave the least possible air space. The lid was then affixed securely to prevent access of air or escape of sulphur dioxide.

Strengths of the sulphur dioxide solution ranging from 0.02 per cent. to 2 per cent. were tried. In preparation of the solutions sulphur dioxide gas was led into cold water until the water contained 4-5 per cent. of the gas in solution. The exact strength was then determined by titration with a 0.1 normal solution of Iodine, and the stock solution diluted to the required degrees.

Experiments were carried out with the following fruits : apples, plums, raspberries, loganberries, black and red currants, blackberries, gooseberries, strawberries and oranges. With the exception of gooseberries and black and red currants completely satisfactory results were obtained with all solutions of appropriate strength. With plums especially, of which all the well-known varieties were tried, the results were excellent. In the case of black and red currants and gooseberries the fruits kept very well, but a certain hardening of the skins took place, which did not completely disappear when the fruit was stewed or converted into jam.

As regards strength of solution necessary to give satisfactory preservation, all strengths below .06 per cent. SO_2 were inadequate. Occasional instances occurred in which solutions below that limit showed complete absence of development of any micro-organisms, but the results were not sufficiently consistent. Strengths ranging from .06 to .08 per cent. have proved almost invariably satisfactory and from .08 per cent. upwards complete preservation has been invariably obtained in all the series of tests at Long Ashton. At the Campden Research Station, where the method has since been tried on a semi-commercial scale, occasional failures with .08 per cent. solutions have been experienced in the case of raspberries. It is believed that these were attributable to no inadequacy in the preservative power of the solution at that strength, but to packing of the fruit in the containers. The latter were large earthenware jars of 8 gallons capacity. Such a mass of soft fruit of the raspberry character tends to become compressed into a dense mass, to the interior of which it is not easy for the preservative solution to penetrate. Failure in such cases is not surprising unless, before the jars are sealed, particular care is taken to ensure proper mixing

of fruit and solution. Another possible contributory cause may have been disproportion between the amount of fruit and the volume of preservative solution. On this point the following results of the Long Ashton trials have some bearing.

Analyses have shown that after storage of fruit in the preservative solution for some time in sealed air-tight jars the strength of sulphur dioxide in the solution is greatly reduced. This result is well illustrated by the accompanying analysis made of the contents of a jar of Monarch plums preserved in a 0.08 per cent. solution of sulphur dioxide and examined after 8 months.

TABLE I.

			Weight in grammes.	Sulphur dioxide per cent.	
Plums	..	..	210.9	0.015	} About 1/5th of original strength.
Liquid	..	..	267.1	0.014	
Whole Sample	..	..	4.780	0.014	

Allowing for the quantity of sulphur dioxide absorbed by the plums represented in this table as uncombined SO_2 , there is an actual loss of more than half the original amount added. This loss may be due either to oxidation to sulphuric acid or sulphates or to combination with constituents of the fruit. The available evidence deduced from other analyses suggests the latter as the main source of loss. Hence the proportion of fruit to preservative solution in the container may be of importance in special cases, since an unduly large amount of the former may lead to a reduction of sulphur dioxide strength below the preservative limit, with disastrous results on keeping quality. In practice this probably rarely occurs since, unless the fruit is very closely packed, the volume of solution required to cover it is sufficiently large to ensure the presence of a safe amount of sulphur dioxide.

Examination of the strength of the solution at various periods during storage has shown that the reduction in sulphur dioxide content is of a dual character. Within a few days after bottling there is a large loss, generally equal to about one-half the original amount added: after that time the rate of loss slows down rapidly and further reduction occurs very gradually. Presumably the initial rapid decline in strength of the solution is due very largely to diffusion into the fruit, of which in most cases there is about the same weight in bottle as that of the solution. The slower change later is probably representative of actual chemical changes.

In view of these results it would appear that, while it is necessary to use the preservative solution of a strength not less than 0.08

per cent. SO_2 to allow for absorption by the fruit, one of a concentration of 0.04 per cent. or thereabouts is actually sufficiently toxic to inhibit the growth of micro-organisms which may be placed in it. This figure is thus of significance in connection with the preservation of wines, cider and other beverages. It should not, however, be taken as infallible, since investigations at Long Ashton on this subject in connection with cider have shown that the toxic limit varies according to the conditions of nitrogenous nutrition of the organisms. It is interesting to find that this figure, arrived at directly from the fruit bottling experiments is practically identical with the content of sulphur dioxide (free and combined) permitted by the French Government in wines.

B. Conditions of Storage of Material preserved with Sulphur Dioxide Solutions.

The foregoing work was, as already stated, carried out entirely in vessels from which air was absolutely excluded. Since fruit pulp is usually stored in bulk in wooden casks, which, as the cider work at Long Ashton has repeatedly proved, are far from air-tight, and since sulphur dioxide is both readily volatile and oxidizable, the results described may only be applicable for a relatively short time for pulp or fruit stored in this way in bulk. Recent trials at the Campden Research Station have shown that whole fruit stored in the wood in a 0.08 per cent. solution of sulphur dioxide keeps sound for an unexpectedly long time when the casks are securely bunged. On the other hand pulp behaves very irregularly.

The importance of using air-tight vessels was demonstrated in a few isolated instances in the preceding series of experiments, where the rubber rings used to make the air-tight seal for the glass jars became defective during the prolonged storage. In those cases moulds began to develop in the jars even when the strength of the solution used was in the first instance well above the toxic limit.

Since the use of casks is so convenient for storage purposes, various methods of overcoming the difficulty of air access have been tried, none so far with complete success for pulp. Following out a suggestion that the presence of small amounts of a suitable chemical acting as an inhibitor for oxidation might slow down oxidation sufficiently to retain the sulphur dioxide in toxic amount, a number of substances unobjectionable from the food point of view were tested in this respect. These included glycerine, salt, various sugars, gum, lactic and tartaric acids, and alcohol. The appended tables give some of the results and in certain instances show some

evidence of inhibitory action. Nothing so far tried has been marked enough in its action to offer promise of practical significance, but the possibility of further advance along this line should be kept in mind.

The results in the above table for the control untreated solutions show the rapid loss of sulphur dioxide when air has free access to the liquid. It is clear, therefore, that the exclusion of air must be an essential point in any storage system utilised when this antiseptic is adopted as the preservative agent.

The substitution of another form of container for bulk storage in the place of wood has been considered. The objection in all cases so far examined which yield satisfactory storage is the relatively high cost of the storage vessel. As opportunity arises other forms will be examined. The problem of the container is in fact practically the same as that which the writers have under investigation in connection with cider and to which they have already referred in their article on "The Bottling of Ciders" which appears in another part of this Report

The ideal container for work on a large scale, but for its cost, would probably be the glass-lined cement tank used so extensively in France for the storage of wine and cider. Casks well coated inside with paraffin wax or one of the special cask linings would serve the purpose, as long as they could be kept airtight.

Some experiments with small cement containers (cement 1 part, sand 2 parts, Pudlo 5%) covered with several layers of paraffin wax and mixtures of paraffin wax and rosin have been made. With them there has invariably been a certain blackening of the fruit and the wax cover protecting the surface of the cement has been attacked in places.

TABLE II.
RATE OF LOSS OF SO_2 IN AQUEOUS SOLUTIONS IN PRESENCE OF SMALL AMOUNTS OF OTHER SUBSTANCES.

Series 1.—

Treatment.	Substance added.	% Content of SO_2 at end of test.
50c.c. of 1 per cent. solution, with addition of substances named. Kept in open bottles for 25 days at laboratory temperature.	Nil. control a.	0.0
	Nil. control b.	0.0
	Glycerine 1 drop	0.0128
	" 2 drops.	0.0320
	" 10 "	0.0064
	" 20 "	0.0128
	Salt 0.2%	0.0128
	" 0.4%	0.0128
	Dextrose 0.4%	0.0256
	" 1.0%	0.0256
	Gelatine 0.1%	0.0128

Series 2, 3, 4, 5 and 6.—

Treatment.	Substance added.	Iodine Value*	
		at start	at finish
Series 2.—			
100c.c. of SO ₂ solution (about 2.3% strength), kept in large closed bottle for 5 days and agitated in shaking apparatus daily for 1 hour.	Nil.	7.3	5.4
	Cane sugar 1%	7.4	5.6
	" 2%	8.5	6.7
	" 5%	7.2	5.2
	" 10%	11.4	8.1
	" 20%	8.6	5.9
	" 50%	6.8	4.0
	" 60%	7.0	3.0
Series 3.—			
As in Series 2, except that strength of SO ₂ solution used was approximately 1% and duration of test 3 days.	Nil.	3.9	3.6
	Alcohol 3%	3.4	3.4
	Lactic Acid 1%	3.8	3.5
	Tartaric Acid 1%	3.8	3.6
	Gum 0.2%	3.3	3.1
	Dextrose 5%	3.7	3.4
Series 4.—			
As in Series 2, but duration of test 10 days.	Nil. a	8.6	3.4
			(Stopper leaking)
	" b.	8.6	5.8
	Alcohol 1%	8.4	5.1
	" 2%	8.3	5.7
	" 4%	8.4	5.7
	" 6%	8.1	5.4
Series 5.—			
As in Series 2, but duration of test 4 days.	Nil.	8.2	3.5
	Alcohol 1%	8.0	3.9
	" 2%	8.0	4.3
	" 3%	7.7	4.2
	" 4%	7.7	4.3
Series 6.—			
As in Series 2, with stronger SO ₂ solution.	Nil.	11.8	7.0
	Alcohol 3% +		
	Cane Sugar 3%	11.2	7.3
	Alcohol 3% +		
	Glycerine 1%	11.5	7.7
	Cane Sugar 2% +		
	Glycerine 1%	11.4	7.4

* Expressed in number of c.c. of .1 N Iodine Solution used in titration of 1c.c. SO₂ solution.

C. The Action of Sulphur Dioxide on Fruit.

Apart from the preservative action of sulphur dioxide by inhibiting the growth of micro-organisms. this substance has a definite effect on the fruit itself.

Its action at strength 0.08 per cent. solution on certain enzymes naturally present in the fruit was investigated some time ago by Miss Watson and Mrs. S. P. Wiltshire in the laboratory at Long Ashton. They found that the enzymatic activities of diastase, invertase and zymase were completely stopped in a solution of that strength. It was concluded that the same would be the case when the fruit itself was kept in a similar solution. Subsequent experience in practice has provided this conclusion to be justified. Probably all enzyme activity within the fruit is stopped and the enzymes themselves destroyed, the living cells of the fruit being killed at the same time. Mr. Appleyard, continuing work on this part of the subject at the Campden Research Station, has recently obtained direct evidence on this point, detailed particulars of which will be published later.

It has been found that fruit preserved in this way shows a progressive loss of "setting" or "gelling" power when made into jam according to length of time it has been stored in the solution. The suggestion has been made that this reduction of "gel" value is due to reduction of pectin content by its conversion to pectic acid or other derivatives by the action of the enzyme pectase. On that assumption this enzyme would need to be resistant to sulphur dioxide. The evidence available is against this view. Apart from the improbability of a particular enzyme remaining unaffected when all others are destroyed, there is no occasion to assume that the pectin change in this case is brought about by the enzyme. Pectin solutions depreciate regularly in "gel" value on long standing and fruit pulp, in which all the enzymes are destroyed by boiling, shows a similar deterioration. It is difficult to obtain satisfactory comparative figures, but there has been no clear evidence during the course of this work to show that pectin loss is much more rapid in the one case than in the other. The writers' view is that in each instance the pectin change is a gradual hydrolysis taking place in an acid medium without the intervention of pectase and that the rate of change is determined by the composition of the system.

A noticeable change produced in the fruit by the preservative solution is a marked bleaching of the colour. The red colouring matters are those most affected. Red plums, strawberries, red currants and, to a rather less extent, raspberries and loganberries lose their red colour, being either completely bleached to white or retaining in various degrees a pink tint. The blue and purple colours are more resistant. Thus black currants, blackberries, damsons and blue plums remain of a more natural appearance.

Yellow and green pigments are little affected by the 0.08 per cent. solution. Greengages and yellow plums are accordingly not noticeably changed. The loss of colour, where it occurs, is temporary and persists only so long as sulphur dioxide is present. When the fruit is removed from the preservative solution and subjected to heat in jam-making or cooking, the sulphur dioxide is driven off and the original natural colour returns. A slight proportion is apparently permanently destroyed, since the final colour obtained after heating is rather less deep than the original : but so insignificant is the loss that the method has no drawbacks in its application on that account.

The remaining action of the preservative solution calling for mention is the toughening effect on the skins of gooseberries and currants to which reference has been made earlier in the paper. This is a definite disadvantage in the use of the method for these fruits and so far no means of overcoming it have been found.

D. Applications of the Method.

The previous part of this paper has been concerned with the detailed description of a method by which fruit can be preserved whole for an indefinite time in a solution of sulphur dioxide of the lowest possible effective strength. So weak is it in fact that after treatment and without removal of the antiseptic, the quantity of the latter present in the fruit itself is no greater than is permissive by French law in wines and ciders. When in addition there is taken into account the point that in heating the preserved material the sulphur dioxide is practically entirely driven off, it is evident that there is here a simple method of fruit preservation suitable for any purpose for which the fruit can be used after cooking and free from any objection on the score of effect on the health of the consumer.

The original purpose in view at the start of the investigation was to arrive at a method of dealing with fruit pulp which would render the use of the latter in jam manufacture less open to objection than at present. In this matter the interest of the fruit grower is considerable, for fruit pulping enables the jam industry to absorb more fruit in seasons of heavy crops and gluts than could be taken if the fruit could only be converted into jam while in the fresh condition. From a more general point of view also a method which enables supplies of fruit to be put aside until required, in that way relieving congestion in the jam factory during the height of the fresh fruit season, must tend to the production of jam under better conditions and from sounder raw materials.

The main result of the work has been not so much to improve the position in respect of the fruit pulping method—although to a material extent this has been done by the information gained both on the conditions of storage required and the reduced quantity of preservative which can be made effective—as to provide an alternative method of preserving the fruit which possesses great advantages over the pulping method. The most important of these are (a) great saving in time, the fresh fruit being packed direct into the storage vessel and then simply covered with the preservative solution and sealed down; (b) larger quantities of fruit can be preserved during the fruit season; (c) no preliminary cooking or pulping, thus rendering unnecessary the provision of special pulping apparatus and equipment; (d) the fruit is preserved whole instead of being reduced to a state of pulp, enabling a more attractive grade of jam to be made; (e) less sulphur dioxide is required for preservation; (f) the costs of preservation are reduced very greatly by the elimination of the boiling and pulping process; (g) the preserved material keeps better; and (h) the quality of the jam made from the preserved material is much superior, being almost on a par with that of jam made from fresh fruit. Relating to the latter point the following analysis of jam made from fruit preserved in this manner is of interest in showing that the preservative is practically eliminated in the course of stewing and jam making. These figures were furnished by the sample of Monarch plums, other details concerning which have already been given in Table I.

TABLE III.

				Weight in grammes.	Sulphur dioxide per cent.
<i>Composition after stewing</i>					
Plums	..	..	..	102.8	0.007
Liquid	..	..	..	54.5	0.004
Whole Sample	..	..	..	157.5	0.006
Composition of Jam	..	..	..	—	0.003

The method is therefore put forward not as a substitute for pulping in the jam industry but as one to supercede it by virtue of its superiority in almost every respect. It is in addition equally applicable to jam making on a smaller scale and under domestic conditions. While normally in the latter case the stock of jam is made during the course of the fruit season from fresh fruit, there are occasions, particularly where persons use their own home-grown fruit, when it is a distinct advantage to be able to put aside a supply of fruit to await conversion into jam until a convenient opportunity.

Fruit thus preserved also serves a valuable purpose outside jam making. It can be brought into use in all respects in place of

canned or bottled fruit. For the past four years the writers have tested it under domestic conditions as stewed fruit and for pies and puddings, and have found it as good as fruit bottled and sterilised in the ordinary way. If anything, the flavour is rather better. For red fruits the colour is sometimes slightly less. It is necessary to observe a little precaution when used in the home. It is, of course, unfit for consumption until it has been cooked, but, since all the uses proposed involve cooking in any case, this does not incur any additional operation. Generally by the time the fruit is cooked the sulphur dioxide has been completely carried off in the steam. Before finishing off the stewing it is, however, advisable for those unacquainted with the method to taste the fruit to ascertain if any flavour of the preservative remains. Its flavour is so pronounced and familiar to all that very small amounts can be readily detected in this way. If any taste is noticeable, the cooking should be continued for a slightly longer time till nothing can be detected. It is then in fit condition for consumption. When used in tarts and puddings this procedure is not possible. As a precautionary measure in these cases the fruit may be stewed for a short time and kept at the boil for a few moments before being placed in the tart or pudding, the latter being cooked in the usual manner. This pre-cooking is not generally necessary, but is a simple means of ensuring satisfactory results.

For home use this method of preserving is proposed as a substitute for bottling on account of its simplicity and the saving of time and trouble. The bottling method is equally good as regards quality of product and is absolutely safe in the sense that there is not risk of preservative being taken into the system of the consumer: in other respects the advantage rests with the sulphur dioxide method.

There are other possibilities with regard to details of method of treatment, handling of the produce and mode of use which offer promise of increasing the utility of this form of preservation. Investigations on these are now in progress at the Campden Research Station.

E. Details of Method for General Use.

While the details of the method have been indicated earlier in the paper in connection with the experimental work, the particulars advised for general use may be somewhat amplified.

Fresh gathered fruit in sound condition should be selected for preservation. The preservative fluid should be an aqueous solution of sulphur dioxide of a strength not less than 0.08 per cent. nor

more than 0.1 per cent. SO_2 . The fruit should be prepared as for bottling, stalks, etc., being removed. It should then be placed in the storage vessel, the latter being well filled with the fruit and care being exercised that packing in a solid mass does not occur. In the case of soft, easily compressible fruit, such as raspberries, which easily aggregate into a solid mass, a small quantity of the solution should be placed first in the receptacle and the latter agitated at intervals during the packing, further liquid being added as the vessel is filled up. This will ensure thorough mixing of the fruit and preservative. When sufficient fruit has been added, the vessel should be filled as completely as possible with the solution, to cover the fruit entirely and leave the smallest possible air-space above. The vessel should then be sealed down. It is important to see that the seal is airtight. Provided these operations are properly carried out, no further attention should be required until the fruit is wanted for use. The vessel is then unsealed and the fruit removed. The liquor in the vessel may be used with the fruit at discretion. It contains appreciable quantities of flavouring substances diffused from the fruit. Its use, however, should be accompanied by rather longer cooking than when the fruit is used without it, for there is more of the preservative to be driven off. When the fruit is to be used without it, the liquor should be drained off and the fruit itself may be rinsed with water to remove any adherent liquor.

As regards the type of storage vessel, for small scale work fruit bottles and earthenware jars are satisfactory. As to the methods of sealing these and suitable receptacles for larger scale work detailed information can be obtained on application from the Resident Director, Research Station for Fruit and Vegetable Preservation, Chipping Campden, Glos. Supplies of the preservative solution of standard strength can also be procured from that institution.

In conclusion, it may be stated that the recent Departmental Committee on Preservatives appointed by the Ministry of Health have had this method of preserving fruit under consideration, and in their recently issued Report have recommended that sulphur dioxide within limits which somewhat exceed those required in this connection should be permissible for fruit preservation. It may, therefore be accepted that the use of this preservative in the manner here indicated is regarded as legitimate and not detrimental to health. The publication of the details of this work has been deferred for some time so that the recommendations of that Committee might be available for reference.

EXPERIMENTS ON THE CONTROL OF WILLOW BEETLES.

(A. H. Lees.)

For many years the willow growing regions of Somerset have been troubled by the attack of species of *Phyllodecta* and *Galerucella*. These beetles cause extensive damage to the rods both in the larval and adult stage, large quantities of leaf tissue being devoured. The beetles frequently occur in enormous numbers and spraying has been practised for many years. Fifteen years ago when the writer was investigating the damage due to *Galerucella* sp. control was obtained by using a commercial brand of nicotine soap. At that time arsenate of lead was not favoured though no reason could be discovered for its neglect. Recently, however, the nicotine soap had apparently, in some cases at any rate, failed to give the desired result and the matter was brought to the writer's notice by the Willow Officer attached to Long Ashton.

Laboratory trials were started in the winter of 1924 in order to find some means of killing that might be applicable in the field. A supply of *Phyllodecta vitellina* was obtained and used as a test insect.

At first a good many failures were encountered. Amongst these were "red oil," paraffin and soap, paraffin and calcium caseinate, paradichlor-benzene dissolved in paraffin and made up with soap.

"Red oil" is an oil that emulsifies in dilute sodium carbonate; it has given good results in the laboratory against *Anthonomus pomorum*, the Apple Blossom Weevil, but it failed even at a 5% strength against *Phyllodecta*. Paraffin emulsified with calcium caseinate gave fair results at a 10% strength, but they were not good enough to justify more extended trials.

Nicotine Sprays.

Experiments with soap and nicotine with or without paraffin indicated that the presence of paraffin made no difference nor was a 2% soap solution superior to a 1% solution. Various strengths of nicotine were tried, 4, 6, 8, and 12 oz. per 100 gallons. From the 4 oz. strength an average kill of 30% was obtained and from the 8 oz. strength 32% kill. In one case where 12 oz. per 100 gallons was used no kill at all was obtained. The failure of nicotine was somewhat surprising but the behaviour of the beetles suggested that recovery was due to the volatility of nicotine, only anæsthesia being produced. Accordingly nicotine sulphate was substituted for nicotine in equivalent quantities (20 oz. nicotine sulphate = 8 oz. nicotine). This mixture was much more effective and at 30 oz. to the 100 gallons a 100% kill was obtained. This formula was accordingly used later in a field trial.

Arsenate Sprays.

No information as to why arsenate spraying was not favoured by willow growers could be obtained but there was more than one possible reason. Thus :—

- (1) It might burn the foliage.
- (2) It might fail to kill.
- (3) It might kill but fresh foliage might be produced so quickly that the beetles, by starving for a short time, might escape its action.

To test (1) willow plants in pots were sprayed with arsenate up to a strength of 8 lbs. powder per 100 gallons, equivalent to a strength of 16 lbs. of paste to the 100 gallons ; no burning resulted.

To test (2) several sprayings were made using a commercial brand of powder supposed to contain some amount of " spreader " in its composition. In some cases extra " casein spreader " at .1% strength was added. Table I gives the results.

TABLE I.

Strength used in terms of powder arsenate		With extra .1% Casein Spreader.	No. of dead.	Total insects.	% kill.
4 lbs. per 100 galls.	..	No.	6	23	26
4 " " " "	..	Yes.	24	54	44
8 " " " "	..	No.	6	19	32
8 " " " "	..	Yes.	31	42	74

The beetles were very hungry but very chary of feeding on arsenated foliage. Where no spreader was used and the arsenate was in patches the beetles fed in between. Where a spreader was used very little foliage was eaten but that small amount was sufficient to cause a considerable mortality. The influence of the spreader and increased strength are clearly to be seen in the tabulated results and it is thus evident that a very effective cover must be obtained before the beetles are forced to take the poison. The 8 lbs. per 100 gallons strength was used later in a field trial.

Arsenate Dusts.

If a dust could be used instead of a spray much labour could be saved. Accordingly a 10% and 20% arsenate powder lime dust were tried. Both were about equally effective but neither so much as the liquid form.

The first formula was subsequently used in the field trial.

Field Trials.

These were done on small plots on a plantation in Mid-Somerset. Reference is made to them in the Advisory section of the Report by the Willow Officer.

The treatments were as follows :—

- (1) Dusting with arsenate-powder-lime dust (10% arsenate, 90% lime).
- (2) Spraying with arsenate powder and casein spreader (arsenate 8 lbs. powder, casein spreader .1%, water 100 gallons).
- (3) Spraying with nicotine sulphate and soap (nicotine sulphate 30 oz. soap 1%, water 100 gallons).

Rain interrupted operations at the first application on June 20th, but four days later the complete series was repeated under conditions of fine weather.

The experiment was revisited six weeks later in August after a large amount of rain had fallen.

On the controls very little beetle damage had occurred so it was not possible to estimate the efficacy of the treatment as insecticides.

The arsenate powder and spreader spray had, however, adhered very well indeed and is evidently almost proof against rain after it is once dry.

The dust had remained fairly well also but probably not sufficiently well to prove effective.

No certain information could be gathered from the result of the nicotine sulphate spray though there was a distinct suggestion that other pests had been controlled to some extent.

In view of the promising results obtained it is hoped to repeat these experiments this season.

**XVI.—ANNUAL REPORT OF THE CONSULTING CHEMIST,
1924.**

(*Dr J. A. Voelcker, M.A., F.I.C.*).

During the year 36 samples were submitted by members of the Society for analysis. This is very similar to the number—40—sent in 1923. The samples were as follows :—

Linseed Cake	9
Cotton Cake	11
Calf Food	2
Pig Meal	2
Compound Meal	1
Sharps	1
Superphosphate	1
Basic Slag	1
Peruvian Guano	1
Kainit	2
Sulphate of Ammonia	2
Nitrate of Soda	1
Limestone	1
Water	1
	<hr/>
	36
	<hr/>

LINSEED CAKE.

These were generally of satisfactory nature, quality and price. Seven were quite pure, one was of moderate quality only and might have been better, while one sample was decidedly impure. The latter, though rich in oil (12.81 per cent), contained a considerable amount of starchy impurities and also weed seeds in excess.

One sample of Linseed Cake sent me from Dorset was so exceptionally free from impurities that I endeavoured to ascertain form whence it came. I experienced considerable difficulty in doing this, and the most that I could find out was that the seed had come from Calcutta and was known as “ Calcutta No. 1 quality.”

That prices and quality do not always go together is instanced by a comparison of the two following analyses :—

LINSEED CAKE.				A	B
Moisture . . . . .	..	..	..	11.82	10.90
Oil . . . . .	..	..	..	8.07	11.05
Albuminoids . . . . .	..	..	..	27.62	27.25
Carbohydrates . . . . .	..	..	..	38.30	37.17
Woody Fibre . . . . .	..	..	..	8.00	7.25
*Mineral Matter . . . . .	..	..	..	6.19	6.38
				<hr/>	<hr/>
				100.00	100.00
				<hr/>	<hr/>
*including Sand . . . . .	..	..	..	.99	1.32

Both cakes were pure, but, whereas A cost £15 per ton, B, which was 3 per cent richer in oil, was charged at £14 3s. 6d. per ton only, under like conditions.

COTTON CAKE.

Of the eleven samples eight were good, but one, while being rich in oil (6.09 per cent), was very woolly, and two others were in unsatisfactory condition.

CALF FOODS.

The two samples sent were represented by the following analyses, and, as will be seen, their composition is very different :—

CALF MEAL AND NUTS.

	A	B
	Meal.	Nuts.
Moisture	10.33	13.84
Oil	13.77	6.35
Albuminoids	16.56	19.31
Carbohydrates	48.98	48.26
Woody Fibre	4.52	5.29
*Mineral Matter	5.84	6.95
	<hr/> 100.00	<hr/> 100.00
Nitrogen	2.65	3.09
*including Sand .. .. .	.99	.96

A was composed principally of Linseed, Rice meal and Locust Meal; there was however rape present, and with this, some mustard seed also, which gave a very pungent taste to the meal and made it distinctly objectionable to give to calves.

B consisted mainly of Palmnut Meal with some Linseed and also Beans. On comparing the two analyses it will be seen that A, apart from the objection referred to, was much richer in fat, while B was the more nitrogenous food and would probably be better suited for the later stages of feeding.

PIG MEALS.

The two samples submitted gave the following analyses :—

PIG MEAL.

	A	B
Moisture	10.96	11.30
Oil	2.89	4.39
Albuminoids	9.44	16.90
Carbohydrates	57.57	60.66
Woody Fibre	12.95	
*Mineral Matter	6.19	6.75
	<hr/> 100.00	<hr/> 100.00
Nitrogen	1.51	2.70
*including Sand and Silica	4.03	.79

A had been stated to contain Barley Meal and Middlings together with 2 per cent. of Fish Meal and a certain proportion of rice husk. While the Fish Meal was marked by its scarcity in the sample, the rice husk was very prominent, this being shown by the high proportion of fibre and the excessive siliceous matter. On this account I should consider the meal to be both unsatisfactory and unsuitable for pig-feeding.

B had been guaranteed as containing $5\frac{1}{2}$ per cent. of oil and $19\frac{1}{4}$ per cent. of albuminoids, but, as will be observed from the analysis, there was a deficiency of 1 per cent. of oil and one of 2 per cent. of albuminoids. Otherwise it was free from objection, and the component parts, which consisted mainly of wheat, oats and barley with Fish Meal and dried Yeast, were quite suitable for the purpose of feeding to pigs.

SHARPS.

The sample of Sharps sent was clean and in sound condition.

SUPERPHOSPHATE.

The one sample submitted, which was sold as being 30 per cent "soluble," gave 29.25 per cent soluble phosphate. It was reasonably priced.

BASIC SLAG.

The one sample sent was of excellent quality and very well ground. It gave:—

		per cent.
Total Phosphates	..	44.38
Fineness	.. ..	89

This, at £3 12s. 6d. per ton delivered, was decidedly cheap.

KAINIT.

Both samples of Kainit sent were good and the prices were reasonable. They gave respectively, 14.79 and 15.23 per cent. of Potash.

SULPHATE OF AMMONIA.

One of the two samples was of Neutral Sulphate of Ammonia, it being very dry and giving 21.08 per cent. of Nitrogen, equal to 25.63 per cent. of Ammonia. The other sample was found lying about in a barn, the owner not knowing what it was. It was of yellow colour, but turned out to be quite good Sulphate of Ammonia.

NITRATE OF SODA.

The sample submitted gave :—

Nitrate of Soda 96.35 per cent.

Although of good quality, this was of very lumpy nature and would require breaking down before it could be used.

LIMESTONE.

It is somewhat remarkable that, despite the attention which has been directed to the need of liming land, only one sample of the kind was submitted to me for analysis. This was called "Limestone Dust" and gave the following analysis :—

LIMESTONE DUST.

Oxide of Iron and Alumina	..	..	2.05
Lime	..	..	46.38
Magnesia	..	..	4.21
Silica	..	..	5.31
Carbonic Acid, water, etc.	..	..	42.05
			<hr/> 100.00 <hr/>

This was produced at a quarry on the estate of the member who sent the sample. The analysis shows it to have been of only fair quality, the proportions of silica and magnesia contained being both considerable. If obtainable near at hand it would, no doubt, be wise to make use of this, which it may be said was very finely ground and capable of ready distribution. If, however, it be a matter of sending by rail, I cannot but think that it would be much better to use burnt lump lime, which, it has to be remembered, has nearly twice as much actual lime as has limestone itself.

WATER.

The one sample of water, sent from the neighbourhood of Salisbury, was a rather hard one, containing 22.96 grains per gallon of Total Solids, but it was quite a satisfactory drinking supply.

Bath and West and Southern Counties Society.

TAUNTON MEETING, 1924.

JUDGES.

HORSES.

Shire.—F. W. GRIFFIN, Boro' Fen, Peterborough.

Percherons.—HON. A. E. PARKER, Norton Curlieu, Warwick.

Hunters.—HON. A. E. PARKER, Norton Curlieu, Warwick.

Welsh Mountain.—J. E. HERBERT, Brynamman, Carmarthenshire.

Dartmoor.—B. PHILLPOTTS, Rora House, Ilsington, S. Devon.

Exmoor.—R. J. COLLYNS, Bilboa, Dulverton.

Any Agricultural Breed.—HON. A. E. PARKER, Norton Curlieu, Warwick.

Remount Selling Classes.—Inspector of Remounts.

Saddle.—HON. A. E. PARKER, Norton Curlieu, Warwick.

Harness.—A. W. HICKLING, Wing Old Hall, Rutland.

Jumping.—LIEUT.-COL. SIR DENNIS F. BOLES, Bart., C.B.E., D.L., Watts House, Taunton.

CATTLE.

Devon.—F. J. YENDELL, Upcott, North Molton.

South Devon.—T. W. LUSCOMBE, Great Englebourne, Harberton, Totnes.

Shorthorn.—MAJOR C. BEHRENS, Swinton Grange, Malton, Yorks.

Dairy Shorthorn.—MAJOR G. J. BUXTON, Tockenham Manor, Wootton Bassett.

Hereford.—G. H. BRAY, Dormington Court, Hereford.

Sussex.—REV. F. S. SCLATER, Newick Park, Lewes.

British Friesian.—STUART HEATON, Iken, Tunstall, Suffolk.

Aberdeen-Angus.—MURRAY CONACHER, The Royal Farms, Windsor.

Red Poll.—J. S. THOMSON, Poulton Priory Farm, Fairford, Glos.

Welsh Black.—P. REYNOLDS, Treglenais, Croesgoch, Letterston.

Ayrshire.—W. HUNTER, Templand Mains, Cummock.

Jersey Cows and Heifers.—A. MILLER HALLETT, Goddington, Orpington, Kent.

Jersey Bulls.—J. A. PERREE, Oaklands, St. Saviour's, Jersey.

Guernsey.—C. F. DIXON, Arundel House, Winchester Road, Southampton.

Kerry.—G. T. BARHAM, Sudbury Park, Wembley, Middlesex.

Dexter.—G. T. BARHAM, Sudbury Park, Wembley, Middlesex.

Milk Test.—A. F. SOMERVILLE, Dinder House, Wells, Somerset.

Butter Test.—A. F. SOMERVILLE, Dinder House, Wells, Somerset.

SHEEP.

Devon Longwoolled.—R. COOK, Crazelowman, Tiverton.

South Devon.—S. G. HORTON, Lixton, Loddswell, Devon.

Kent or Romney Marsh.—H. B. AMOS, Ripton, Ashford, Kent.

Southdown.—A. C. HARRIS, Donnington Manor, Chichester.

Hampshire Down.—T. A. E. HAYTER, Highbury, Whitchurch, Hants.

Oxford Down.—C. E. J. HOBBS, Maisey Hampton, Fairford.

Dorset Horn.—C. HAWKINS, Waddon, Upwey, Dorchester.

Dorset Down.—T. LEE, Woodsford, Dorchester.

Exmoor Horn.—W. GAMMIN, The Barton, Simonsbath, Somerset.

Dartmoor.—S. BICKELL, Westcott, Coryton, Lew Down.

Suffolk.—N. EVERETT, Rushmere, near Ipswich.

Ryeland.—T. E. DAVIES, Winkfield Manor Farm, Ascot.

Kerry Hill.—J. HAMAR, The Farlauds, Brampton Bryan, Herefordshire

GOATS.

H. S. HOLMES PEGLER, Coombe Bury House, Kingston-on-Thames.

PIGS.

Berkshire.—T. A. E. HAYTER, Highbury, Whitchurch, Hants.

Large Black.—H. J. KINGWELL, Bow Grange, Totnes, Devon.

Large White.—R. W. CARSON, Lea Hall, Hatfield Heath, Essex.

Middle White.—W. IKIM, Foxleigh, Wem, Shropshire.

Gloucestershire Old Spots.—J. B. DOWDING, Fairfield, Leominster.

Wessex Saddleback.—E. E. RALLS, Wade Park Farm, Totton, Hants.

Welsh.—T. BOWEN, Llandre, Llanfyrnach, Pembs.

Long White Lop-Eared.—R. R. DAWE, Ford, Sydenham Damerel, Tavistock.

PRODUCE.

Cider.—A. T. PRICE, Blackhall, Berkeley, Glos.

Cheese.—A. TODD, British Dairy Institute, Reading.

Cream Cheese, Butter and Cream.—MRS. A. M. LUKE, 9, St. James's Place, The Hoe, Plymouth.

COMPETITIONS.

Butter-making—MRS. A. M. LUKE, 9, St. James's Place, The Hoe, Plymouth.

Milking.—J. MACKINTOSH, National Institute for Research in Dairying, Shinfield, near Reading.

Shoeing.—J. C. COLEMAN, M.R.C.V.S., The Limes, Croft Road, Swindon.

POULTRY.

A. G. PITTS, Berrow, Burnham-on-Sea and G. DOBLE, Royal Ashton Hotel, Taunton.

HORTICULTURE.

C. C. TUDWAY, Milton Lodge, Wells, Somerset.

FORESTRY.

C. O. HANSON, Divisional Officer, Forestry Commission, 51, Queen Street, Exeter.

PRIZE AWARDS, 1924.

* * An animal designated in this list as the "reserve number" is entitled, *conditionally*, to succeed to any Prize that may become vacant in its class by reason of the animal placed above it by the Judges afterwards failing to qualify.

† Animals where not otherwise stated, may be considered to have been bred by the Exhibitor.

ABBREVIATIONS EXPLAINED :—S., sire ; d., dam ; s.d., sire of dam ; y., year ; m., month ; w., week ; d., day ; R., Reserve ; V.H.C., Very Highly Commended ; H.C., Highly Commended ; C., Commended.

The Prizes in Classes 26, 41 and 42 were contributed by the Taunton Local Committee, and £125 towards the Prizes in the Horses, Cattle, Sheep and Pig Classes by the Somerset County Agricultural Association.

HORSES.

SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book).

CLASS 1.—*Shire Mare, in-foal, or with foal at foot.* [6 entries].

I. (£15).—O. WILLIAMS, J.P., Crossways, Cowbridge, Glam., bay, **Torrell's Bohemian Girl**, foaled 1917, bred by J. Carson, Torrell's Hall, Willingale, Ongar, Sussex ; s Sandside Sensation, d Norbury Bohemian Girl, s d Dowsby Forest King ; with foal by Field Marshall 5th.

II. (£10).—L. B. BEAUCHAMP, Norton Hall, near Bath, bay, **Delay Clansmaid**, foaled 1920, bred by R. E. Rennison, Wall Grange Farm, Leek, Staffs ; s Champion's Clansman (29221), d Daisy (70359), s d Redlynch Forest King (23626) ; with foal.

III. (£3).—T. H. GOLLEDGE, Wraxall, Shepton Mallet, bay, **Bluebell** (73566), foaled 1912, bred by W. R. Monk, Tuckey, Winslow, Bucks ; s Halstead Blue Blood (27397), d Salden Blossom (40090), s d Dunsmore Willington Boy (13021) ; with foal by Theale Lockinge (35246).

CLASS 2.—*Shire Filly or Gelding, foaled in 1923.* [8 entries].

I. (£10).—G. B. PARKES, Parkfield, Quinton, Birmingham, bay filly, **Parkfield Magdalene**, bred by J. Vaughan, The Moors, Welshpool ; s Moors Nulli Secundus, d Moors Magdalene, s d Moors Kitchener.

II. (£5).—L. B. BEAUCHAMP, Norton Hall, near Bath, black filly, **Heather** ; s Marden Peter (33356), d Longforth White Heather (78649), s d King Cole 7th (26351).

III. (£3.)—W. J. LITTLETON, Helland Barton, Bodmin, Cornwall, bay filly, **Theale Boadicea**, bred by A. T. Loyd, Lockinge, Wantage; s Lincoln Fowler (37602), d Lockinge Beatrix (85564), s d Huttoft Combine (29462).

R.—R. Q. ROWETT, LL.D., Ely Place, Frant, Sussex, brown filly, **Venus of Frant**; s Avesford Champion (37089), d Frida of Sunbridge (84913), s d Mimm's Champion (26462).

H.C.—F. W. PARSONS & SON, Speckington, Ilchester, bay filly, **Speckington Lady Freda**; s Speckington Coming King (35211), d Parkfield Lass (68121), s d Claydon Nobility (25078).

CLASS 3.—Shire Filly or Gelding, foaled in 1922. [4 entries].

I. (£10.)—J. Q. ROWETT, LL.D., Ely Place, Frant, Sussex, bay filly, **Cropper Floss**, bred by G. H. Hawsworth, Cropper Top, Etwell, Derby; s Babingley Nulli Secundus (26993), d Brickendon Floss (87649), s d Severn Champion (27759).

II. (£5.)—F. W. PARSONS & SON, Speckington, Ilchester, bay filly, **Cockburg Coming Queen** (113938), bred by J. Preston-Jones, Rushbury, Winchcombe, Glos.; s Sundridge Coming King (33568), d Roel Linnet (86235), s d Bramhope Gay Duke (22152).

III. (£3.)—W. J. CUMBER, Theale, Berks, bay filly, **Theale Sweetbriar** (115591); s Sundridge Nulli Secundus (36952), d Theale Roseleaf (105981), s d Ratcliffe Forest King (23622).

R.—T. EVANS, C.B.E., J.P., Craig-y-parc, Penttyrch, near Cardiff, black filly, **Pentwyn Princess**; s Langdon Nomination, d Victoria.

CLASS 4.—Shire Filly or Gelding, foaled in 1921. [2 entries].

I. (£10.)—F. W. PARSONS & SON, Speckington, Ilchester, bay filly, **Speckington Dorothy Queen** (112968); s Speckington Coming King (35211), d Lubenham Daisy (78664), s d Babingley Nulli Secundus (26993).

MEDAL (A).

GIVEN BY THE SHIRE HORSE SOCIETY AND OPEN ONLY TO MEMBERS OF THE BATH AND WEST SOCIETY ELECTED NOT LESS THAN SIX MONTHS PREVIOUS TO MARCH 31, 1924.

A Gold Medal, or the sum of £5, for the best Mare or Filly in the Shire Horse Classes, under Condition 47, and to the Breeder of the winner under the Condition stated, a Prize of £5.

I.—O. WILLIAMS, J.P., Crossways, Cowbridge, Glam., bay **Torrell's Bohemian Girl**, foaled 1917, bred by J. Carson, Torrell's Hall, Willingale, Ongar, Sussex; s Sandside Sensation, d Norbury Bohemian Girl s d Dowsby Forest King; with foal by Field Marshall 5th.

R.—J. Q. ROWETT, LL.D., Ely Place, Frant, Sussex, bay filly, **Cropper Floss**, bred by G. H. Hawksworth, Cropper Toy, Etwall, Derby ; s Babingley Nulli Secundus (26993), d Brickendon Floss (87649), s d Severn Champion (27759).

CLASS 5.—Shire Stallion, foaled in 1922. [2 entries].

I. (#10.)—J. Q. ROWETT, LL.D., Ely Place, Frant, Sussex, bay, **Frant Combination** (39193), bred by C. S. Whitburn, Addington Park, near West Malling, Kent ; s Champion's Combination (33096), d Monk's Green Elizabeth (85801), s d Friar Tuck 4th (31447).

II. (#5.)—W. J. CUMBER, Theale, Berks, brown, **Theale Manners** (39355), bred by J. R. Moreton, Spring Farm, Crewe ; s Theale Lockinge (35246), d Primley Glow-worm (82608), s d Dunsmore Premier (25469).

CLASS 6.—Shire Colt, foaled in 1923. [4 entries].

I. (#10.)—W. J. CUMBER, Theale, Berks, bay, **Theale Drayman**, bred by J. R. Whittaker, Railway Tavern, Elton, Sandbach ; s Theale Locksmith (37900), d Eccleston Ladyship (97984), s d Bateby Fellowship (33407).

II. (#5.)—O. WILLIAMS, J.P., Crossways, Cowbridge, Glam., bay, **Crossways Forest Gay Lad** ; s Herontye Goalkeeper, d Crossways Forest Maid, s d Friar Tuck 4th.

III. (#3.)—L. B. BEAUCHAMP, Norton Hall, near Bath, bay, **Delny Prince** ; s Marden Peter (33356), d Chilcompton Daydream (84331), s d King Cole 7th (26351).

PERCHERONS.

CLASS 7.—Percheron Mare, in-foal, or with foal at foot [4 entries].

I. (#10.)—SIR H. H. A. HOARE, Bart., Stourhead, Zeals, S.O., Wilts, light grey, **Nemesis** (B.203), foaled 1913, bred by — Bruneau, Chatelet, Ponce, St. Calais, France ; s Javelot (F.85339), d Baronne (F.54305), s d Tertois (F.42511) ; with foal by Rhum (B.53).

II. (#5.)—J. JOYCE, Milverton, Somerset, grey, **Saigne** (B.298), foaled 1918, bred by — Massey, Haut Meslin, d'Origny-C-Roux, Belleme, Mortange, L'Orme, France ; s Lagor (F.100512), d Perrugue (F.125420) ; with foal.

III. (#3.)—SOMERSET COUNTY COUNCIL, Cannington Court Farm Institute, near Bridgwater, Somerset, grey, star, **Sapotelle**, foaled 1918, bred by A. Latouche, St. Leonard-des-Parcs, Courtoner, d'Alencon, l'Orme, France ; s Nonce (F.117982), d Nellie (F.118363), s d Ermite (F.44360) ; with foal.

CLASS 8.—Percheron Colt or Filly Foal, produce of Mare in Class 7. [2 entries].

I. (#5.)—SIR H. H. A. HOARE, Bart., Stourhead, Zeals, S.O., Wilts, grey filly, **Destiny**, foaled March 21.

CLASS 9.—Percheron Colt, Filly or Gelding, foaled in 1921 or 1922.
[2 entries].

I. (£10.)—SOMERSET COUNTY COUNCIL, Cannington Court Farm Institute, near Bridgwater, Somerset, dark grey gelding, foaled 1922 ; s Brampton Britain, d Ratatine (B.325), s d Nectar (F.117636).

II. (£5.)—SIR H. H. A. HOARE, Bart, Stourhead, Zeals, S.O., Wilts, grey gelding, **Stourhead Paravent** (B.113), foaled 1921 ; s Parapet (B.9), d Finette (B.38). s d Pinson (F.63112).

HUNTERS.

CLASS 10.—Hunter Mare, in-foal, or with foal at foot. [9 entries].

I. (£15.)—F. H. UNWIN, Longdon Hall, Tewkesbury, grey, **Stainless**, aged ; s Abstainer ; with foal by Dibs.

II. (£10.)—MAJOR H. DENISON PENDER, D.S.O., M.C., Strangeways, Marnhull, Dorset, bay, **Pavlova 3rd** (H.I.S.B. 5828) ; with foal by Political.

III. (£3.)—WARRE & UNWIN, Longdon Hall, Tewkesbury, chestnut, **Patricia 4th**, foaled 1916, bred by J. Norbury, Knutsford, Cheshire ; s Sly Patrick, d Wishful, s d Anklebiter ; with foal by Dibs.

R.—W. C. H. ESDAILE, Cothelstone House, Taunton, chestnut, **Virtue**, foaled 1916 ; s Red Sahib, d Patience 4th ; in foal.

H.C.—W. J. FRYER, C.B.E., Kaylis House, Maidenhead, Berks, bay, **Larch**, foaled 1911, bred by Lieut.-Col. Meysey Thompson, Knaresborough, Yorkshire ; s Birk Gill, d Britannia, s d Prince Vortimer ; with foal by Gay Lally.—H. L. STOREY, The Manor House, Malmesbury, chestnut, **Bridget** ; s Spook, s d Ascetic ; with foal by Rathurde.

C.—E. P. NORTHEY, Higher Bowden, Okehampton, chestnut, **Joan 6th** (6259 H.S.B.), foaled 1914, bred by J. C. Hill, The Cottage, East Anstey, Dulverton ; s King Duncan, d Bridesmaid, s d Gold Medalist ; with foal by Interloper.—H. T. B. SAUNDERS, Woodside Farm, Sparkford, bay, **Lady Egremont** (Vol. vii, No. 5021), foaled 1905 ; s Boy of Egremont, s d May Boy ; with foal by Political.

MEDAL (B).

GIVEN BY THE HUNTERS' IMPROVEMENT AND NATIONAL LIGHT HORSE BREEDING SOCIETY, UNDER CONDITIONS 48 AND 49.

A Gold Medal or £5 and a Bronze Medal, for the Best Hunter Brood Mare, being a prize-winner in Class 10, registered with a number in the Hunter Stud Book at the time of entry or within a month of the award, not having previously won the above-named Society's Gold Medal as a Brood Mare in 1924, and which must have her foal at foot, or produce a living foal in 1924, to a thoroughbred horse or Registered Hunter Sire.

Medal.—F. H. UNWIN, Longdon Hall, Tewkesbury, grey, **Stainless**, aged ; s Abstainer ; with foal by Dibs.

R.—MAJOR H. DENISON PENDER, D.S.O., M.C., Strangeways, Marnhull, Dorset, bay, **Pavlova 3rd** (H.I.S.B. 5828); with foal by Political.

CLASS 11.—*Hunter Filly, Colt or Gelding, foaled in 1923.* [8 entries].

I. (210.)—H. L. STOREY, The Manor House, Malmesbury, chestnut colt, **Bachelor**; s Rathurde, d Bessie.

II. (25.)—MISS WELLESLEY, Ford House, Churchinford, Chard, Somerset, chestnut colt, **Rockette** (G.S.B.), bred by T. Chalcraft, Alton, Hants; s Rocksavage, d Blanchette, s d Cerasus.

III. (23.)—W. N. UNWIN, Arle Court, Cheltenham, bay colt, **Craig Heron**, bred by Sir Lindsay-Hogg, Bart. (the late); s Herodote, d Abbey Craig, s d Wolf's Crag.

R.—W. YEO, Newton Tracey, Barnstaple, bay filly, **Gay Lady**; s Gay Lally, d Lady Egremont (5021).

H.C.—MAJOR WINGFIELD DIGBY, D.S.O., M.F.H., Sherborne Castle, Dorset, chestnut filly, **Queen's Quair**; s King's Prize, d Queenie.

C.—Ditto, ditto, brown filly, **Vanity**, bred by Mrs. McCall, Foys, Chetnole, Sherborne; s Monkey Tricks.

CLASS 12.—*Hunter Filly, Colt or Gelding, foaled in 1922.* [8 entries].

I. (210.)—H. L. STOREY, The Manor House, Malmesbury, bay gelding, **Bailrigg** (708 H.S.B.); s Rathurde, d Bessie.

II. (25.)—W. J. FRYER, C.B.E., Kalyis House, Maidenhead, Berks, bay gelding, **Polarch**, bred by Major E. M. Watts, Eastwood Park, Falfield, Glos.; s Political, d Larch, s d Birk Gill.

III. (23.)—F. GOVIER, Town Marsh, Dulverton, brown gelding, **Nimrod**; s Monkham, d Starlight, s d Rockaway.

R.—T. EVANS, C.B.E., J.P., Craig-y-Parc, Penttyrch, near Cardiff, chestnut filly, **Pentwyn Polly**; s Jangling Geordie, d Violet.

H.C.—MISS WELLESLEY, Ford House, Churchinford, Chard, Somerset, chestnut gelding, **Santoy** (Vol. 10 H.S.B. 675), bred by H. & G. Edwards, Norton Malreward, Bristol; s Gay Lally, d Primrose, s d Dare Devil.

CLASS 13.—*Hunter Filly or Gelding, foaled in 1921.* [7 entries].

I. (210.)—MRS. W. HARCOURT WEBB, Spring Grove, Bewdley, Worcs., bay mare, **Gay Lassie 3rd**, bred by R. P. Cawsey, Huntshaw, Torrington, Devon; s Gay Lally, d Princess 13th (5949).

II. (25.)—W. YEO, Newton Tracey, Barnstaple, brown gelding, **Dark Duke**; s Win Stanley.

III. (23).—H. T. B. SAUNDERS, Woodside Farm, Sparkford, bay filly, **Gay Lassie 2nd** (Vol. x, 6027); s Gay Lally, d Lady Egremont, s d Boy of Egremont.

R.—MRS. M. OWEN WILLIAMS, Crossways, Cowbridge, Glam., chestnut filly, **Princess**, bred by D. Davies, M.P., Llandinam, Mont.; s Bachelor's Image, d Lottery.

H.C.—H. L. STOREY, The Manor House, Malmesbury, chestnut mare, **Moonshine** (6217 H.S.B.), bred by Miss A. Hick, Mytton Hall, Whalley, Lancs.; s Moonlighter, d Mary Hamilton (Vols. 7. 8 and 9, H.S.B.).

C.—I. L. JONES, Olivemead, Dauntsey, Wilts, chestnut filly, **Freedom**, s Forum, d Countess.

CLASS 14.—*Hunter Mare or Gelding, foaled before 1921, that had not won a prize of £10 or over under saddle at any Show held previous to April 1, 1924.* [16 entries].

I. (210).—MAJOR R. M. STEWART RICHARDSON, Idoover House, Dauntsey, Chippenham, Wilts, bay gelding, **Swallett Gate**, foaled 1919, bred by M. O'Farrell, Longford, Westmeath; s Ludgate, d by Blitz.

II. (25).—MAJOR W. HARCOURT WEBB, Spring Grove, Bewdley, Worcs., chestnut gelding, **Rocklight**, foaled 1920, bred by W. Yeo, Newton Tracey, Barnstaple; s Captain Rush, d Deep Sea.

III. (23).—W. E. STOKES, Great Bowden, Market Harboro, chestnut gelding, **The Chef**, foaled 1919; s Cookhall, s d Strong Drink.

R.—SIR A. CORY-WRIGHT, Bart., Ayot Place, Welwyn, Herts, gelding, foaled 1917, **Fairyhouse**.

H.C.—J. K. STEVENSON, The Chase, Upper Welland, Marvern Wells, Worcs., chestnut gelding, **Red Dart**, 5y., bred by J. S. Reed, Breford Grange, Driffield, Yorks; s Bick Gill, s d Wales.

C.—S. PETCH, Milborne Port, Somerset, bay gelding, **Mars Hill**; s Marzio, d Ida, s d Locksley.

CLASS 15. *Hunter Mare or Gelding, foaled in 1920.* [9 entries].

I. (210).—T. H. PEARCE, Parsonage Farm, Long Ashton, chestnut gelding, **Golden Prince**, bred by — Salisbury, Brislington; s King's Prize.

II. (25).—L. C. HALLETT, Tintinhall Court, Martock, Somerset, chestnut gelding, **Harkaway**, bred by H. H. Paisy, Lidstone, near Kingsbridge, South Devon; s Renown, d Lassie.

III. (23).—MAJOR W. HARCOURT WEBB, Spring Grove, Bewdley, Worcs., chestnut gelding, **Rocklight**, foaled 1920, bred by W. Yeo, Newton Tracey, Barnstaple; s Captain Rush, d Deep Sea.

R.—MISS E. K. WALKER, Cook's Folly, Bristol, bay mare, **Seashore**, foaled 1920, bred by S. Codrington, Chipping Sodbury; s Red King.

C.—F. W. PARSONS, Speckington, Ilchester, red roan gelding, **Paratus**, foaled 1920.

CLASS 16.—*Hunter Mare or Gelding, foaled before 1921, to carry not more than 12 stone 7 lbs.* [8 entries].

I. (220.)—W. E. STOKES, Great Bowden, Market Harboro, chestnut gelding, **The Chef**, foaled 1919; s Cookhall, s d Strong Drink.

II. (210.)—J. K. STEVENSON, The Chase, Upper Welland, Malvern Wells, Worcs., chestnut gelding, **Red Dart**, 5y., bred by J. S. Reed, Breford Grange, Driffeld, Yorks; s Bick Gill, s d Wales.

III. (23.)—S. PETCH, Milborne Pore, Somerset, bay gelding, **Mars Hill**; s Marzio, d Ida, s d Locksley.

R.—MISS WELLESLEY, Ford House, Churchinford, Chard, Somerset, brown mare, **Gabrielle 2nd** (Vol. 9 H.S.B. 5803), foaled 1919, bred by W. Lofthouse, Bishopsthorpe, Yorks; s Tantamount, d Gulliver, s d Curfew.

CLASS 17.—*Hunter Mare or Gelding, foaled before 1921, to carry over 12 stone 7 lbs. and under 14 stone.* [11 entries].

I. (220.)—A. JAMES, Totterdown, Bristol, chestnut mare, **Princess Alice**, foaled 1919; s The Manor, s d by Pop-off.

II. (210.)—L. C. HALLETT, Tintinhall Court, Martock, Somerset, chestnut gelding, **Harkaway**, bred by H. H. Paisy, Lidstone, near Kingsbridge, South Devon; s Renown, d Lassic.

III. (23.)—MAJOR R. M. STEWART RICHARDSON, Idoer House, Dauntsey, Chippenham, Wilts, bay gelding, **Swallett Gate**, foaled 1919, bred by M. O'Farrell, Longford, Westmeath; s Ludgate, d by Blitz.

R.—LADY SOMERS, Eastnor Castle, Ledbury, Herefordshire, chestnut mare, **Miss Magtart**, foaled 1915, bred by the Hon. Mrs. Dunville, Navan, Co. Meath, Ireland; s Master Magpie, d V.R., s d Bergomask.

H.C.—CONSTANCE, DUCHESS OF WESTMINSTER, Hazelgrove, Sparkford, Somerset, dark brown mare, **Polly Peacham**; s Reynard.

C.—MAJOR H. SINCLAIR, Goodrington Cottage, Paignton, bay, **Freedom**, foaled 1918; s Captivation, s d General Peace.

CLASS 18.—*Hunter Mare or Gelding, foaled before 1921, to carry 14 stone or over.* [12 entries].

I. (220.)—W. E. STOKES, Great Bowden, Market Harborough, chestnut gelding, **Bullace**, foaled 1917.

II. (210.)—CONSTANCE, DUCHESS OF WESTMINSTER, Hazelgrove House, Sparkford, Somerset, grey gelding, **Twink**, foaled 1917.

III. (23.)—MRS. S. PETCH, Milborne Port, Somerset, bay gelding, **Astrologer**; s Skiagraph.

R.—MISS M. A. BULLOWS, Edgbaston Riding School, Birmingham, bay gelding, **Stort**, foaled 1919, bred by W. Vizzard, Tonbridge, Kent; s Stortford (145), d Winkie, s d Hanover Square.

H.C.—MAJOR WINGFIELD DIGBY, D.S.O., M.F.H., Sherborne Castle, Sherborne, Dorset, brown gelding, **Donellan**, foaled 1918.—Lieut-Col. SIR DENNIS F. BOLES, Bart., C.B.E., D.L., Watt's House, Taunton, chestnut gelding, **Clonmel**, foaled 1918.

SILVER MEDAL (C).

A Silver Medal or £1 (at the option of the winner) for the best Hunter Mare or Gelding of any age, exhibited (and being a prize-winner), in Classes 14 to 18 by a member of the Hunters' Improvement and National Light Horse Breeding Society whose application for membership must be lodged within a month of the award.

Medal.—A. JAMES, Totterdown, Bristol, chestnut mare, **Princess Alice**, foaled 1919; s The Manor, s d by Pop-off.

WELSH MOUNTAIN PONIES.

CLASS 19.—*Welsh Mountain Pony Brood Mare, foaled in or before 1920, not exceeding 12.2 hands, neither docked nor hogged, in-foal or with foal at foot.* [3 entries].

I. (£10.)—MRS. A. C. LYELL, Ness Pony Stud, Neston, Cheshire, grey, **Ness Iris**, foaled 1917; s Grove Arclight (845), d Penarth Flower Girl (2211), s d Champion Shooting Star (73); with foal.

II. (25.)—F. F. MASON, The Faraam, Killay, Glamorgan, grey, **Faraam Silverlight** (3803), foaled 1911, bred by M. Lloyd, Llanwdr; s Dyoll Starlight 4th, d Dyoll Quicksilver; with foal by Bwlch Quicksilver.

CLASS 20.—*Welsh Mountain Stallion, foaled in or before 1920, not exceeding 12.2 hands and neither docked nor hogged.* [4 entries].

I. (£10.)—F. F. MASON, The Faraam, Killay, Glamorgan, grey, **Grove Grey Dawn** (893), foaled 1914, bred by Mrs. Green, Craven Arms; s Dyoll Starlight (4), d Grove Greyling (2879), s d Stretton Dynamite (76).

II. (25.)—F. PEARCE, Fair View House, Pengam, Mon., odd cream and grey mixed, **Pengam Hero** (Vol. 23, W.S.B. 1183), foaled 1917, bred by J. Bowdler, Persondy, Merthyr, Dovan, near Barry.

DARTMOOR PONIES.

CLASS 21.—*Dartmoor Mare, not exceeding 13 hands, in-foal, or with foal at foot.* [4 entries].

I. (210.)—MISS CALMADY-HAMLYN, J.P., Pearroc Vean, Buckfast, South Devon, grey, **Scintilla** (4523), aged; with foal by The Leat.

II. (25.)—THE HON. MRS. W. B. LINDLEY, Corfe House, Taunton, grey, **Greybird**, foaled 1914; with foal.

CLASS 22.—*Dartmoor Stallion, not exceeding 13 hands.* [1 entry].

I. (210.)—MISS CALMADY-HAMLYN, J.P., Pearroc Vean, Buckfast, South Devon, bay, **The Leat** (1068), foaled 1918, bred by H.R.H. The Prince of Wales, K.G., Tor Royal; s Dwarka, d Dartmoor (3758), s d Dartmoor.

EXMOOR PONIES.

CLASS 23.—*Exmoor Mare, not exceeding 12.2 hands, 2 years old and over on May 27, 1924, with or without foal at foot: to be led.* [4 entries].

I. (28.)—W. CROCKFORD, Hawkwell Farm, Wheddon Cross, Taunton, bay, **Lady Bird**, foaled 1915, bred by the late Sir T. D. Acland, Holnicote, near Allerford, Taunton.

II. (24.)—S. J. WESTCOTT, Zeal Farm, Hawkridge, dun, **Ashway No. 3 Star**, (1), foaled 1919, bred by the late Sir T. D. Acland, Bart., Old Ashway, Dulverton.

III. (22.)—W. CROCKFORD, bay, **Rosebud**, foaled 1918, bred by the late Sir T. D. Acland, Holnicote, near Allerford, Taunton.

CLASS 24.—*Exmoor Colt or Filly, under 2 years old on May 27, 1924: to be led.* [4 entries].

I. (28.)—S. J. WESTCOTT, Zeal Farm, Hawkridge, bay colt, **King of the Forest No. 3 Star** (1), foaled 1922, bred by R. J. Westcott.

II. (24.)—Ditto, ditto, filly, **Lorna No. 8 Star** (1), bred by R. J. Westcott.

III. (22.)—W. CROCKFORD, Hawkwell Farm, Wheddon Cross, Taunton, bay, **Pride of the Moor**, foaled 1922; s Shurdon, d Rosebud.

R.—LORD POLTIMORE, Court Hall, North Molton, North Devon, grey filly, **Polly**, foaled 1922; s Brownie.

CLASS 25.—*Exmoor Stallion, not exceeding 12.3; 2 years old and over on May 27, 1924: to be led.* [4 entries].

I. (28.)—LORD POLTIMORE, Court Hall, North Molton, North Devon, brown, **Brownie**, foaled 1920.

II. (§4.)—T. PRING, Great Champson, Molland, Devon, dark bay, **Champson Nut**, foaled 1918, bred by the late Sir T. D. Acland, Killerton ; s Astway.

III. (§2.)—W. CROCKFORD, Hawkwell Farm, Wheddon Cross, Taunton, bay, **Nimrod**, foaled 1919, bred by the late Sir T. D. Acland, Holnicote, near Allerford, Taunton.

R.—EARL FORTESCUE, Castle Hill, Barnstaple, bay or brown, **Blackmoor 2nd**, foaled 1921, bred by — Harris, Wistland Pound, Kentisbury ; s Blackmoor (P.P.S.B. 631).

ANY AGRICULTURAL BREED.

CLASS 26.—*Mare or Gelding, foaled before 1922, suitable for general work and the property of a resident within 20 miles of Taunton, shown in hand without gear.* [4 entries].

I. (§5.)—G. W. MOODY, Stapleton, Martock, bay, **Stapleton Princess Mary**.

II. (§2.)—A. A. BROUGHTON, Impens, North Petherton, bay mare, **Eling Champion Bloom**.

III. (§1.)—F. W. PARSONS & SON, Speckington, Ilchester, bay filly, **Speckington Dorothy Queen**.

REMOUNT SELLING CLASSES.

(The Inspector of Remounts had the option of purchasing any Animal in Class 27 for £90 ; in Class 28 for £120 ; and in Class 29 for £55).

CLASS 27.—*Mare or Gelding, unbroken or partly broken, three years old, not less than 15.2, and 4 years old, not less than 15.3 hands, undocked, suitable for Officers' chargers. Shown in hand.* [7 entries].

I. (§10.)—L. L. JONES, Olivemead, Dauntsey, chestnut filly, **Freedom**.

II. (§5.)—A. BRAKE, Bearley, Tintinhull, Martock.

R.—Ditto, ditto.

CLASS 28.—*Mare or Gelding, not under 5 years, nor over 7 years old ; not less than 15.3 nor over 16.1 hands, undocked, suitable for Officers' Chargers. Ridden.* [24 entries].

I. (§10.)—A. JAMES, Totterdown, Bristol.

II. (§5.)—C. E. IRELAND, Staunton, Gloucester, bay, foaled 1917.

R.—H. WORRALL, Bagborough, Taunton, chestnut, **Tallisman**, 6 years.

CLASS 29.—*Mare or Gelding, not under 4 years nor over 6 years old, not less than 15.1½ nor over 15.3 hands, undocked; suitable for Artillery Gun Horses. Ridden.* [3 entries].

I. (£10.)—T. HEARD, St. James' Street, Taunton, dark brown gelding, **Tom**.

SADDLE.

CLASS 30.—*Hack Mare or Gelding, 15 hands and over, ridden on the 2nd day of the Show.* [15 entries].

I. (£10.)—MAJOR R. M. STEWART RICHARDSON, Idoover House, Dauntsey, Chippenham, bay mare, **Kitten on the Keys**.

II. (£5.)—THE LADY TERRINGTON, M.P., Spinfield, Marlow, Bucks, chestnut mare, **Edgarvio**, foaled 1918.

III. (£2.)—MRS. R. P. HUMPHRIES, Battledown Manor, Cheltenham, chestnut gelding, **Paddy**, foaled 1918.

R.—MISS WELLESLEY, Churchinford, Chard, brown mare, **Gabrielle 2nd**.

H.C.—Ditto, ditto, bay mare, **Cinderella**, foaled 1914.

C.—A. JAMES, Totterdown, Bristol, chestnut mare, **Princess Alice**.

CLASS 31.—*Pony, not over 13 hands, suitable for and ridden by a child not over 12 years of age last birthday, on the second day of the Show.* [5 entries].

(A Whip was presented to the best Boy and best Girl Riders in this Class).

I. (£5.) and Whip.—MISS A. SAVILL, Avon Lodge, Lower Woodford, Salisbury, grey gelding, **It**.

II. (£4.) and Whip.—H. WORRALL, Bagborough, Taunton, mare, **Butterfly**.

III. (£2.)—THE HOLMROOK STUD, Stone Lodge, Bridgetown, near Dulverton, grey gelding, **Michael**.

R.—Ditto, ditto, black roan gelding, **Blastation**, foaled 1918.

CLASS 32.—*Hack Mare or Gelding, any height, ridden by a lady on the third day of the Show.* [15 entries].

I. (£10.)—MAJOR R. M. STEWART RICHARDSON, Dauntsey, Chippenham, bay mare, **Kitten on the Keys**.

II. (£5.)—MRS. R. P. HUMPHRIES, Cheltenham, chestnut, **Paddy**.

III. (£2.)—CONSTANCE, DUCHESS OF WESTMINSTER, Sparkford, brown mare, **Polly Pencham**.

R.—MISS WELLESLEY, Churchinford, Chard, brown mare, **Gabrielle** 2nd.

H.C.—MAJOR WINGFIELD DIGBY, D.S.O., M.F.H., Sherborne Castle, Sherborne, Dorset, bay filly, **Princess Dainty**.

CLASS 33.—*Hack Mare or Gelding, under 15 hands, ridden on the fourth day of the Show.* [9 entries].

I. (£10.)—MRS. M. M. FITZGERALD, Marsden Manor, Cirencester, chestnut mare, **Nosegay**.

II. (£5.)—MRS. J. O. MUNTZ, Foxhams, Horrabridge, Devon, chestnut mare, **Moonbeam**.

III. (£2.)—MAJOR WINGFIELD DIGBY, D.S.O., M.F.H., Sherborne Castle, Sherborne, Dorset, bay filly, **Princess Dainty**.

R.—MISS M. M. PARKES, Lapal House, Quinton, Birmingham, bay gelding, **Bright Idea**.

H.C.—MISS A. MACLEOD, Easton-in-Gordano, **Good Gracious**.

CLASS 34.—*Polo Pony, not over 15 hands, 4 years old and over, ridden on the fifth day of the Show.* [9 entries].

I. (£10.)—MRS. M. M. FITZGERALD, Marsden Manor, Cirencester, chestnut mare, **Nosegay**.

II. (£5.)—MRS. J. O. MUNTZ, Foxhams, Horrabridge, chestnut mare, **Moonbeam**.

III. (£2.)—S. PETCH, Milborne Port, chestnut gelding, **Prairie Fire**.

R.—MISS C. L. HARDING, Sellarsbrook, near Monmouth, bay gelding.

CLASS 35.—*Pony, not over 14 hands, suitable for and ridden by a child not over 14 years of age last birthday, on the fifth day of the Show.* [10 entries].

(A Whip was presented to the best Boy and best Girl riders in this Class).

I. (£5.) and Whip.—MISS B. WHITTAKER, Rivenhall, Church Stretton, bay filly, **Mirage**.

II. (£4.) and Whip.—THE HOLMBROOK STUD, Bridgetown, near Dulverton, **Blastation**.

III. (£2.)—H. WORRALL, Bagborough, Taunton, **Butterfly**.

IV. (£1.)—G. CORNER, M.A., Wellington School, Somerset, chestnut mare, **Beauty**.

R.—S. BURR, Ox House, Shaftesbury, Dorset, brown gelding, **Happy**.

H.C.—MASTER H. G. BROMFIELD, Churchstanton, bay, **Kestrel**.

C.—H. N. DAY, Worle, Weston-super-Mare, brown mare, **Diana**.

HARNESSES.

CLASS 36.—(*Novice Class*). *Mare or Gelding, not over 14 hands, that had not previously won a prize of over £5 in value in Single Harness at any Show previous to January 1, 1924, driven on the first day of the Show.* [6 entries].

I. (£10.)—MRS. H. HICKERY, 107, Barrow Road, Bristol, bay gelding, **Glennoon Success**.

II. (£5.)—H. W. WETTEN, 6, Kingsmead Square, Bath, dun mare, **Braishfield Topaz**, foaled 1920, bred by Mrs. A. C. King, Braishfield Manor, near Romsey; s Wattie, d Malbourne Mannett.

III. (£3.)—F. RAY CARTER, Cot Manor, Barnstaple, **Gem**.

CLASS 37.—(*Novice Class*). *Mare or Gelding, over 14 and not over 15 hands, that had not previously won a prize of over £5 in value in Single Harness at any Show held previous to January 1, 1924, driven on the first day of the Show.* [3 entries].

I. (£10.)—H. J. COLEBROOK, Fulmer, Bucks.

II. (£5.)—H. W. WETTEN, 6, Kingsmead Square, Bath, chestnut gelding, **Madock Fire**.

CLASS 38.—(*Novice Class*). *Mare or Gelding, over 15 hands, that had not previously won a prize of over £5 in value in Single Harness at any Show held previous to January 1, 1924, driven on the second day of the Show.* [4 entries].

I. (£10.)—A. MAITLAND, Thornleigh, Vicar's Cross, Chester, bay gelding, **Cestrian Royalist**, foaled 1918.

II. (£5.)—MRS. BARNETT-HOPLAND, Kings Somborne, Hants, chestnut gelding, **Firefly**.

CHAMPION PRIZE (D).

Best Mare or Gelding shown in Single Harness in Classes 36 to 38, judged on the second day of the Show.

I. (£10.)—A. MAITLAND, Thornleigh, Vicar's Cross, Chester, bay gelding, **Cestrian Royalist**, foaled 1918.

CLASS 39.—*Pair of Mares or Geldings driven in Double Harness on the third day of the Show.* [4 entries].

I. (£15.)—NIGEL C. COLEMAN, 1, Upper Grosvenor Street, London, W., brown gelding, **Lochardil** (G217); and brown mare, **Silhouette of Nork**.

II. (£7.)—H. J. COLEBROOK, Fulmer, Bucks.

III. (23.)—A. MAITLAND, Thornleigh, Vicar's Cross, Chester, browns, **Cestrian Furious** and **Cestrian Fury**.

IV. (22.)—W. H. BURSTON, Norton Fitzwarren, **M.P.** and **King Edward**.

CLASS 40.—*Tandems, Mares or Geldings, driven on the third day of the Show.* [3 entries].

I. (215.)—H. J. COLEBROOK, Fulmer, Bucks.

II. (27.)—N. C. COLEMAN, I, Upper Grosvenor Street, London, W., brown gelding, **Lochardil** (G217) ; and brown mare, **Silhouette of Nork**.

III. (23.)—A. MAITLAND, Thornleigh, Vicar's Cross, Chester, browns, **Cestrian Furious** and **Cestrian Fury**.

LOCAL TRADESMEN.

In Classes 41 and 42, points were awarded for condition of horse, vehicle and harness and general turnout.

CLASS 41.—*Mare or Gelding, 14.3 hands or over, the property of a Tradesman carrying on business within the borough of Taunton, used solely by him and driven regularly by himself or his servants, for the delivery of goods sold by him for a period of not less than three months prior to May 27th, 1924, exhibited on the third day of the Show, in Wagon, Trolley, or Cart (not Dog Cart).* [4 entries].

I. (24.)—GOODLANDS, (Ltd.), North Town Wharf, Taunton, **Rock**.

II. (23.)—W. H. HAWKINS, Eastbourne Road, Taunton, **Maggie**.

III. (22.)—A. J. MEDWAY, 2, East Reach, Taunton, **Dick**.

IV. (21.)—GOODHIND & Co., East Street, Taunton.

CLASS 42.—*Mare or Gelding, under 14.3 hands, the property of a Tradesman carrying on business within the Borough of Taunton, used solely by him, and driven regularly by himself or his servants, for the delivery of goods sold by him for a period of not less than three months prior to May 27th, 1924, exhibited on the third day of the Show, in Wagon, Trolley or Cart (not Dog Cart).*—First Prize £4—second £3—third £2—fourth £1—fifth 10s.

[NO ENTRY.]

CLASS 43.—*Mare or Gelding, not exceeding 14 hands, driven on the fourth day of the Show.* [6 entries].

I. (215.)—A. MAITLAND, Vicar's Cross, Chester, brown, **Cestrian Furious**.

II. (27.)—W. H. BURSTON, Norton Fitzwarren, bay, **Melbourne Fire**.

III. (23.)—A. WHITE, Whitchurch, Bristol.

CLASS 44.—*Mare or Gelding, over 14 and not exceeding 15 hands, driven on the fourth day of the Show.* [8 entries].

I. (£15.)—A. MAITLAND, Thornleigh, Vicar's Cross, Chester, bay gelding, **Glenavon Regal.**

II. (£7.)—H. J. COLEBROOK, Fulmer, Bucks.

III. (£3.)—MRS. W. HARDING, Brislington, Bristol, **Leading Article.**

IV. (£2.)—MRS. BARNETT, Hoplands, King's Somborne, chestnut mare

CLASS 45.—*Mare or Gelding, over 15 hands, driven on the fifth day of the Show.* [5 entries].

I. (£15.)—A. MAITLAND, Thornleigh, Vicar's Cross, Chester, chestnut gelding, **Cestrian Rambler.**

II. (£7.)—H. J. COLEBROOK, Fulmer, Bucks, gelding, **Nomination.**

III. (£3.)—MRS. H. HICKERY, 107, Barrow Road, Bristol, **Axholme Victor.**

IV. (£2.)—W. H. BURSTON, Norton Fitzwarren, **M.P.**

CHAMPION PRIZE (E).

Best Mare or Gelding shown in any of the Open Harness Classes 39 to 45, judged on the fifth day of the Show.

I. (£10.)—A. MAITLAND, Thornleigh, Vicar's Cross, Chester, brown, **Cestrian Furious.**

MEDAL (F).

GIVEN BY THE HACKNEY HORSE SOCIETY UNDER CONDITIONS No. 50.

A Silver Medal for the best Mare or Gelding exhibited in Single Harness in Classes 36 to 45, judged on the fifth day of the Show.

Medal.—A. MAITLAND, Thornleigh, Vicar's Cross, Chester, brown, **Cestrian Furious.**

R.—MRS. H. HICKERY, 107, Barrow Road, Bristol, **Axholme Victor.**

JUMPING.

CLASS 46.—*Mare or Gelding, any height, jumping over the course in the best form on the first day of the Show.* [28 entries].

I. (£10.)—E. HOUSE, Statho, Bridgwater, chestnut gelding, **Horton.**

Equal II. (£3 10s.)—F. ALISON, Newbiggin Penrith, **Courage.**

Equal II. (£3 10s.)—A. MASSARELLA, Belmont House, Bentley, **Doncaster.**

CLASS 47.—*Mare or Gelding, under 14.2 hands, jumping over the course in the best form on the first day of the Show.* [14 entries].

I. (£10.)—B. GREEN, Cardrew, Redruth, Cornwall, **Tiptop**.

II. (£5.)—J. HOUSE, Stoke St. Gregory, Taunton, chestnut mare, **Gipsev**.

III. (£3.)—H. N. DAY,⁷ Court Farm, Worle, Weston-super-Mare, brown mare, **Diana**.

CLASS 48.—*Mare or Gelding, 15 hands and over, jumping over the course in the best form on the second day of the Show.* [21 entries].

I. (£10.)—J. HOUSE, Walkers, Boro' Bridge, Bridgwater, bay mare, **Pat**.

II. (£5.)—S. HIGMAN, Crocadon, St. Mellion, brown mare, **Fair Trade**.

III. (£2.)—F. RUDDER, The Pleck, Dorridge, near Brimingham, **Bravo**.

CLASS 49.—*Mare or Gelding, under 15 hands, jumping over the course in the best form on the second day of the Show.* [17 entries].

I. (£10.)—B. W. MILLS, The Manor House, Little Berkhamstead, near Hertford, **Plain Jane**.

II. (£5.)—B. GREEN, Cardrew, Redruth, grey mare, **Tiptop**.

III. (£2.)—R. THACKRAY, Fords Farm, Calcot, Reading, bay gelding, **Don**.

CLASS 50.—*Mare or Gelding, any height, jumping over the course in the best form on the third day of the Show.* [27 entries].

Equal I. (£7 10s.)—C. DORSE, Trull, Taunton, **Yutoi**.

Equal I. (£7 10s.)—A. STUBBS, Alresford, **Saxophone**.

III. (£2.)—T. TAYLOR, Stretton, Warrington, bay gelding, **Jimmy**.

CLASS 51.—*Mare or Gelding, any height, jumping highest on the third day of the Show.* [11 entries]

I. (£10.)—J. HOUSE, Boro' Bridge, bay mare, **Pat**.

II. (£5.)—T. TAYLOR, Stretton, Warrington, bay gelding, **Jimmy**.

III. (£2.)—A. MASSARELLA, Bentley, Doncaster, **Gay Boy**.

CLASS 52.—*Mare or Gelding, 14.3 hands and over, jumping over the course in the best form on the fourth day of the Show.* [19 entries].

I. (£15.)—C. DORSE, Trull, Taunton, **Yutoi**.

Equal II. (£5.)—MAJOR W. H. BROOKE, Kenbury, near Exeter, **Gladeye**.

Equal II. (£5.)—T. GLENCROSS, Stoke Bishop, **Thumbs Up**.

Prizes awarded for Jumping and Devon Cattle.

CLASS 53.—*Mare or Gelding, under 14.3 hands, jumping over the course in the best form on the fourth day of the Show.* [15 entries].

Equal I. (£11.)—B. W. MILLS, Little Berkhamstead, near Hertford, **Plain Jane**.

Equal I. (£11.)—B. GREEN, Cardrew, Redruth, Cornwall, **Tiptop**.

III. (£3.)—R. THACKRAY, Fords Farm, Calcot, Reading, bay gelding, **Don**.

CLASS 54.—*Mare or Gelding, and height, jumping highest on the fifth day of the Show.* [11 entries].

Equal I. (£11.)—F. ALLISON, Newbiggin, Penrith, **Temptress**.

Equal I. (£11.)—A. MASSARELLA, Bentley, Doncaster, **Gay Boy**.

III. (£3.)—T. TAYLOR, Moss Hall, Stretton, Warrington, bay gelding, **Jimmy**.

CHAMPION CLASS.

CLASS 55.—*Mare or Gelding, any height, having won a Prize in Classes 46 to 54, jumping over the course in the best form on the fifth day of the Show.* [13 entries].

I. (£20.)—J. HOUSE, Boro' Bridge, Bridgwater, **Pat**.

II. (£10.)—F. ALLISON, Newbiggin, Penrith, **Temptress**.

III. (£5.)—Ditto, ditto, **Courage**.

SPECIAL PRIZE.

GIVEN BY THE SHOW JUMPING ASSOCIATION TO MEMBERS OF THE ASSOCIATION WHO HAD PAID THEIR SUBSCRIPTIONS FOR THE CURRENT YEAR.

A Silver Medal to the owner of the Horse making the least number of faults in Class 55, the horse being a Prize Winner in the Class and not having previously won the Medal this year.

I.—J. HOUSE, Boro' Bridge, Bridgwater, **Pat**.

CATTLE.

DEVON.

(£27 towards the Prizes in the Devon Classes and the Champion Prize were given by the Devon Cattle Breeders' Society).

CLASS 56.—*Devon Cow or Heifer, in-Milk, Milked in the Ring before judging, under Conditions No. 59.* [7 entries].

I. (£10.)—J. H. CHICK, Wynford Eagle, Dorchester, Dorset, **Wynford Dahlia** (C808), born 15th January, 1920; s Wynford Lascar (9923), d Wynford Daisy (B685), s d Compton Rattler (6309).

II. (25).—Ditto, ditto, **Wynford Pill** (C292), born 23rd July, 1913; s Compton Moses (7015), d Wynford Pink (B353), s d Compton Rattler (6309).

III. (22).—R. A. LEE, Ashford, Cannington, Bridgwater, **Ashford Lady** (C634), born 26th June, 1915, bred by the late G. Reed, Sandhill, Withycombe; s Pound Lord (7834), d Waterhouse, s d Hestercombe Chartist (6397). (Last calf 22nd February, 1924).

R.—N. D. LUPTON, Chalmington, Dorchester, Dorset, **Daisy**, born 4th July, 1918, bred by H. H. Percy, Charton, Rousdon, Lyme Regis; s Stockleigh Rentmaker 2nd (9854). (Last calf 22nd January, 1924).

CLASS 57.—Devon Cow, in-Milk, calved before 1921. [8 entries].

I. (210).—C. MORRIS, Highfield Hall, St. Albans, and Bishop's Lydeard, **Highfield Farthing 8th** (29398), born 26th December, 1916; s Highfield General (8105), d Highfield Farthing 5th (26925), s d Capton Bellringer (4911).

II. (25).—Ditto, ditto, **Highfield Lottie 3rd** (33158), born 18th February, 1920; s Highfield Gauge (9689), d Highfield Lottie (27767), s d Longforth Mailbag (7439).

III. (22).—E. CLATWORTHY, Cutsey, Trull, Taunton, **Jellicoe's Lovely** (30238), born 23rd February, 1917, bred by S. Kidner, Milverton, Somerset; s Nower's Jellicoe (9011), d Goldfinder's Lovely 5th (27695), s d Stockleigh Goldfinder (7268).

R.—MAJOR O. L. TRECHMANN, Westaway, Barnstaple, **Clampit Gay Lass 11th** (30724), born 3rd July, 1917, bred by W. Brent, Callington; s Highfield Gem (8919), d Clampit Gay Lass 4th (24060), s d Lovely's Duke (6145).

CLASS 58.—Devon Heifer, in-Milk, calved in 1921. [5 entries].

I. (210).—C. MORRIS, Highfield Hall, St. Albans, and Bishop Lydeard, **Highfield Daisy 2nd** (34209), born 22nd February; s Overton Favourite (9797), d Daisy 2nd (33126), s d Holcombe Major (7412).

II. (25).—E. G. TRIGGOL, Wood Farm, Fiddington, Bridgwater, **Fiddington Poppy**, born 15th May; s Crazelowman Gold Dust (9625), d Beauty (24050), s d Don Juan (4965).

III. (22).—J. AND C. RAY, Dean Head, Goodleigh, North Devon, **Dean Stuckey** (34322), born 8th March, bred by S. Kidner, Milverton; s Pound Paragon (10285), d Jellicoe's Stuckey 4th (30242), s d Nower's Jellicoe (9011).

R.—H. C. HANCOCK, The Court, Milverton, Taunton, **Court Beaky** (34001), born 5th March; s Gotton Prince 7th (10092), d Court Rebecca 2nd (30113), s d Dodington Dandy (8020).

CLASS 59.—Devon Heifer, calved in 1922. [13 entries].

I. (£10.)—A. M. WILLIAMS, Werrington Park, Launceston, Cornwall, **Ethel 6th** (35530), born 10th July; s Roadwater Goldfinder (10738), d Ethel 4th (C752), s d Conquest (8414).

II. (£5.)—C. MORRIS, Highfield Hall, St. Albans, and Bishops Lydeard, **Highfield Bluebell 2nd** (35222), born 18th April; s Highfield Romance (11070), d Carey Bluebell 2nd (30529), s d Pound Laureate (9428).

III. (£2.)—G. C. SKINNER, Pound, Bishops Lydeard, **Pound Dandelion 3rd**, born 22nd February; s Pound Lasker (10282), d Pound Dandelion (31403), s d Dairyman (7040).

R.—H. GILLHAM, Long Run, Bishops Hull, Taunton, **Taunton Sally** (35031), born 28th March; s Taunton Bugler (10759), d Perry Dairy-maid 2nd (C567), s d Holcombe Cash Box (8545).

C.—R. A. LEE, Ashford, Cannington, Bridgwater, **Ashford Lady's Belle** (35175), born 4th May; s Wellisford Commander 2nd (9395), d Ashford Lady (C634), s d Pound Lord (7834).

CLASS 60.—Devon Heifer, calved in 1923. [15 entries].

I. (£10.)—C. MORRIS, Highfield Hall, St. Albans, and Bishops Lydeard, **Highfield Rose 5th** (Vol. 47), born 3rd January; s Crazelowman Bridegroom (10501), d Highfield Rose 4th (33165), s d Highfield Gauge (9689).

II. (£5.)—E. G. TRIGGOL, Wood Farm, Fiddington, Bridgwater, **Fiddington Plum**, born 24th April; s All Right (10832), d Beauty (24050) s d Don Juan (4965).

III. (£2.)—H. GILLHAM, Long Run, Bishops Hull, Taunton, **Taunton Ruby**, born 8th January; s Cutsey Peer (10974), d Dainty of Brompton (28707), s d Overton Big Ben (7813).

R.—E. CLATWORTHY, Cutsey, Trull, Taunton, **Cutsey Prude**, born 1st June; s Cutsey Peer (10974), d Westcott Perfection 4th (31783), s d Crazelowman Defender (8813).

C.—A. M. WILLIAMS, Werrington Park, Launceston, Cornwall, **April Fool**, born 1st April; s Roadwater Goldfinder (10739), d Goldfinder's Duchess 2nd (26804), s d Stockleigh Goldfinder (7268).

SPECIAL PRIZE.

OFFERED BY C. MORRIS, ESQ.

Best Group of three Females, calved in 1921, 1922 and 1923, bred by the Exhibitor and entered in Classes 58, 59 and 60.—£10 10s.

[NO AWARD].

CLASS 61.—Devon Bull, calved in or before 1921. [4 entries].

I. (£10.)—A. M. WILLIAMS, Werrington Park, Launceston, Cornwall, **Roadwater Goldfinder** (10738), born 29th November, 1918, bred by A. J. Hill, Roadwater, Washford, Taunton; s Lovely's Duke 6th (8965), d Goldencup 79th (28411), s d Lovely's Duke 5th (8573).

II. (£5.)—F. W. VERNEY, Avercombe, Bishopsnympton, North Devon, **Overton Masterpiece** (11152), born 31st May, 1920, bred by A. J. Verney, Overton, Bishops Tawton, Barnstaple; s Stitchpool Favourite's Dairyman (9453), d Overton Myrtle 2nd (25912), s d Stockleigh Masterpiece (6548).

III. (£2.)—C. MORRIS, Highfield Hall, St. Albans, and Bishops Lydeard, **Highfield Reminder 3rd** (11069), born 8th February, 1920; s Highfield Gem 2nd (9329), d Highfield Farthing 2nd (22890), s d Pound Bell-ringer (5617).

CLASS 62.—Devon Bull, calved in 1922. [3 entries].

I. (£10.)—A. L. CHRISTIE, Tapekey Park, Instow, North Devon, **Coombeshead Punch**, born 10th April, bred by H.R.H. The Prince of Wales, K.G., Duchy Home Farm, Stoke Climsland; s Clampit Nonsuch (10924), d Clampit Gladstone 3rd (29768), s d Highfield Gem (8919).

II. (£5.)—C. MORRIS, Highfield Hall, St. Albans, and Bishops Lydeard, **Highfield Nobleman** (11912), born 26th January; s Highfield Gem 2nd (9329), d Northmoor Gipsy 2nd (32455), s d Gotton Prince 2nd (8070).

III. (£2.)—Ditto, ditto, **Highfield Warrior** (11917), born 30th January; s Highfield Gem 2nd (9329), d Highfield Comely (27754), s d Holcombe Reminder (7413).

CLASS 63.—Devon Bull, calved in 1923. [13 entries].

I. (£10.)—R. BRUFORD, Nerrols, Taunton, **Nerrols Best Man**, born 16th February; s Highfield Advance (9318), d Nerrols Harebell 2nd (31667), s d Highfield Chieftain (8915).

II. (£5.)—G. C. SKINNER, Pound, Bishops Lydeard, **Prince**, born 29th February, bred by H. O. Dainton, Lolworth, Cambridge; s Lolworth Mountaineer (11104), d Lolworth Princess (31831), s d Gotton Prince 2nd.

III. (£2.)—A. M. WILLIAMS, Werrington Park, Launceston, Cornwall, **Ham Mill Favourite**, born 1st February, bred by F. J. Stanbury, Ham Mill, Werrington, Launceston, Cornwall; s Ham Mill Referee (11028), d Northmoor Pansy (32460), s d Gotton Prince 2nd (8070).

R.—C. MORRIS, Highfield Hall, St. Albans, and Bishops Lydeard, **Highfield Ringleader** (Vol. 47), born 23rd January; s Highfield Gem 2nd (9329), d Northmoor Cherry (31554), s d Gotton Prince 2nd (8070).

CHAMPION PRIZES.

GIVEN BY H.R.H. THE PRINCE OF WALES, K.G.

A Challenge Cup, value £30 for the best Bull exhibited in Class 61, 62 or 63, to be won three times in succession or four times altogether before becoming the property of the winner.

I.—A. M. WILLIAMS, Werrington Park, Launceston, Cornwall, **Roadwater Goldfinder** (10738), born 29th November, 1918, bred by A. J. Hill, Roadwater, Washford, Taunton; s Lovely's Duke 6th (8965), d Golden-cup 79th (28411), s d Lovely's Duke 5th (8573).

R.—F. W. VERNEY, Avercombe, Bishopsnympton, North Devon, **Overton Masterpiece** (11152), born 31st May, 1920, bred by A. J. Verney, Overton, Bishops Tawton, Barnstaple; s Stitchpool Favourite's Dairyman (9453), d Overton Myrtle 2nd (25912), s d Stockleigh Masterpiece (6548).

GIVEN BY THE DEVON CATTLE BREEDERS' SOCIETY.

Best Animal exhibited in Classes 56 to 63.

I. (210.)—A. M. WILLIAMS, Werrington Park, Launceston, Cornwall, **Roadwater Goldfinder** (10738), born 29th November, 1918, bred by A. J. Hill, Roadwater, Washford, Taunton; s Lovely's Duke 6th (8965), d Golden-cup 79th (28411), s d Lovely's Duke 5th (8573).

R.—F. W. VERNEY, Avercombe, Bishopsnympton, North Devon, **Overton Masterpiece** (11152), born 31st May, 1920, bred by A. J. Verney, Overton, Bishops Tawton, Barnstaple; s Stitchpool Favourite's Dairyman (9453), d Overton Myrtle 2nd (25912), s d Stockleigh Masterpiece (6548).

SOUTH DEVON.

(£10 towards the Prizes in the South Devon Classes were given by the South Devon Herd Book Society).

CLASS 64.—*South Devon Cow or Heifer, in-Milk, calved in or before 1921. [5 entries].*

I. (210.)—H. CHAFFE, Harestone, Brixton, S.O., Devon, **Worswell Gladys 11th**, born 2nd July, 1919; s Widland Champion (6874), d Worswell Gladys 4th.

II. (25.)—G. BANBURY, Stanton Barton, Marldon, Paignton, **Treval Moonflower**, born 24th June, 1918, bred by W. H. Hill, Westerland, Paignton; s Browstone Hero (6430 S.D.H.B.), d Mabel 17th (11621).

III. (22.)—LORD MILDMAY OF FLETE, Flete, Ermington, S.O., Devon, **Lilly 8th** (18524), born 31st January, 1917; s Lilian's Champion (6016), d Lilly 5th (12962), s d Bulleigh Prince (3109).

R.—G. BANBURY, **Stanton Crescent**, born 6th June, 1920; s Elwell Masher (7726 S.D.H.B.), d Crescent (13897), s d Manager (2173).

CHALLENGE CUP.

GIVEN BY H.R.H. THE PRINCE OF WALES, K.G.

A Silver Challenge Cup for the best Cow in-Milk in the South Devon Classes, to be won three times in succession or four times altogether before becoming the property of the winner.

I.—H. CHAFFE, Harestone, Brixton, S.O., Devon, **Worswell Gladys 11th**, born 2nd July, 1919; s Widland Champion (6874), d Worswell Gladys 4th.

CLASS 65.—*South Devon Heifer, calved in 1922.* [3 entries].

I. (**210.**)—F. VIGGERS & SONS, Woodford Farm, Plympton, South Devon, **Saltram Pink 3rd** (27859), born 12th August; s Prawle Rent Payer (9388), d Pink 14th (16022), s d The Monk (5143).

II. (**25.**)—LORD MILDMAY OF FLETE, Flete, Ermington, S.O., Devon, **Flete Carnation** (27260), born 20th March; s Trehele Forester (9500), d Christine's Maid (12961), s d Ley Marquis (2741).

III. (**22.**)—Ditto, ditto, **Flete Lilian** (27262), born 6th January; s Trehele Forester (9500), d Lilian's Maid (14232), s d Doncaster (3720).

CLASS 66.—*South Devon Heifer, calved in 1923.* [2 entries].

I. (**210.**)—LORD MILDMAY OF FLETE, Flete, Ermington, S.O., Devon, **Flete Rosebud**, born 10th August; s Trehele Forester (9500), d Flete Rose (23516), s d Random (7315).

II. (**25.**)—Ditto, ditto, **Flete Countess 3rd**, born 2nd July; s Trehele Forester (9500), d Countess 2nd (18522), s d Lilian's Champion (6016).

CLASS 67.—*South Devon Bull, calved in or before 1922.* [5 entries].

I. (**210.**)—CAPTAIN A. H. STARKEY, Dittisham Court, Dartmouth, **Dittisham Hero**, born 16th November, 1920; s Worswell Premier (6909), d Payne 7th (16501), s d General Gordon (4883).

II. (**25.**)—J. P. CUNDY, Estover, Crownhill, near Plymouth, **Hero 7th** (9217), born 28th March, 1920, bred by J. Rossiter, Kingsbridge; s Charleton Hero (7030), d Dorothy (14456).

III. (**22.**)—LORD MILDMAY OF FLETE, Flete, Ermington, S.O., Devon, **Trehele Forester** (9500), born 25th January, 1920, bred by Mrs. L. Luscombe & Son, Trehele, Modbury, S.O., Devon; s Widland Forester (6875), d Yellow Maid 2nd (14147), s d Coarsewell Monarch (4010).

CLASS 68. *South Devon Bull, calved in 1923.* [1 entry].

I. (**210.**)—LORD MILDMAY OF FLETE, Flete, Ermington, S.O., Devon, **Flete Yellow Boy**, born 14th March; s Trehele Forester (9500), d Flete Countess (23512), s d Random (7315).

SHORTHORN.

CLASS 69.—*Shorthorn Cow, in-Milk, calved before 1921.* [3 entries].

I. (210).—COL. SIR F. BEAUCHAMP, Bart., Woodborough House, near Bath, roan, **Hotchley Countess** (17095), born 19th September, 1920, bred by O. W. Porritt, Hotchley Farm, East Leake, Notts; s Sanquhar Grand Courtier, d Gipsy Countess 3rd, s d Phingasl Comet.

II. (25).—MRS. MANSFIELD, Winterbourne Court, Winterbourne, white, **Rickford Jenny Lind**, born 17th March, 1920, bred by Sir G. A. Wills, Bart., Langford Court; s Collynie Royal Regent (148043), d Jenny Lind 29th, s d Gainford Actor (120331).

C.—W. M. WILLS, Estate Office, Bracken Hill, Leigh Woods, near Bristol, roan, **Wraxall Honeysuckle**, born 11th October, 1918, bred by the late G. H. Butler, Charlton Farm, Portbury, near Bristol; s Colston Phoenix (135834), d Finstall Honesty, s d Master Pansy (96022).

CLASS 70.—*Shorthorn Heifer, in-Milk, calved in 1921.* [2 entries].

I. (210).—HON. MRS. BRUCE WARD, Godinton, Ashford, Kent, roan, **Godinton Jilt**, born 4th February; s Dewlap's Royal Sovereign (125170), d Adbolton Jilt (Vol. 61, p. 794), s d Adbolton Thalia King 2nd (116696).

II. (25).—MRS. MANSFIELD, Winterbourne Court, Winterbourne, **Rickford Augusta 2nd**, born 12th June, bred by Sir G. A. Wills, Bart., Langford Court; s Collynie Royal Regent (148043), d Fairlawne Augusta 8th, s d Esmond (111713).

CLASS 71.—*Shorthorn Heifer, calved in 1922.* [11 entries].

I. (210).—COL. SIR F. BEAUCHAMP, Bart., Woodborough House, near Bath, white, **Rickford Butterfly 3rd**, born 4th March, bred by Sir G. Wills, Bart., Langford Court; s Collynie Royal Regent (148043), d Rickford Butterfly, s d Golden Guardsman (125756).

II. (25).—A. D. GRANT, Winkfield Manor, Ascot, roan, **Winkfield Floss 4th**, born 31st December; s Bright Star (154348), d Florence (Vol. 65, p. 396), s d Millhills Rothés King (138020).

III. (22).—HON. MRS. BRUCE WARD, Godinton, Ashford, Kent, dark roan, **Godinton Groat 6th**, born 1st March; s Dewlap's Royal Sovereign (125170), d Dewlap 3rd (Vol. 58, p. 382), s d Tehidy Robin Hood (97420).

H.C.—H. C. SUTTON, Benham, Newbury, Berks, roan, **Benham Nightlight**, born 26th January; s Proud Augusta (151245), d Benham Dawnlight, s d Benham Mars (140921).

CLASS 72.—*Shorthorn Heifer, calved in 1923.* [15 entries].

I. (210).—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, roan, **Basildon Actress**, born 4th January; s Collynie Orient (170462), d Brier Bud 12th (Vol. 63, p. 635), s d Hean Clarence (125971).

II. (25.)—J. D. WILLIS, Bapton Manor, Codford, Wilts, roan, **Lute**, born 16th January; s Diamond Pierre (162773), d Lyric, s d Boquhan Stamp (114408).

III. (22.)—H. C. SUTTON, Benham, Newbury, Berks, white, **Benham White**, born 8th February; s Albert Charmer (129089), d Adbolton Augusta, s d Boquham Stamp (114408).

V.H.C.—HON. MRS. BRUCE WARD, Godinton, Ashford, Kent, red, **Godinton Orange Blossom**, born 1st January; s Vahan Palatine (167753), d Vahan Orange Blossom 5th (Vol. 67, p. 670), s d Adbolton King Tulip (129026).

H.C.—A. D. GRANT, Winkfield Manor, Ascot, red, **Winkfield Wimple**, born 10th January; s Bright Star (154348), d Wimple 15th (Vol. 66, p. 618), s d Edgcote Lawyer (142219).

C.—COL. SIR F. BEAUCHAMP, Bart., Woodborough House, near Bath, roan, **Rickford Girl**, born 9th April, bred by Sir G. A. Wills, Bart., Langford Court; s Collynie Royal Regent (148043), d Cowslip Girl (Vol. 63, p. 1245), s d Bapton Ruben.

CLASS 73.—*Shorthorn Bull, calved in 1920 or 1921.* [2 entries].

I. (210.)—A. L. CHRISTIE, J.P., Tapeley Park, Instow, North Devon, white, **Tapeley Surprise Packet**, born 28th December, 1920; s Badminton Bertie (146842), d Shenstone Clara 2nd, s d Scottie (133446).

II. (25.)—B. J. BUCKNELL, Gurney St. Farm, Cannington, light roan, **Rhode Jester**, born 15th January, 1921, bred by T. P. Hutchings, Rhode, Bridgwater; s St. Michael of Mulcaster, d Rhode Cowslip, s d Kelmscott.

CLASS 74.—*Shorthorn Bull, calved in 1922.* [7 entries].

I. (210.)—SIR G. A. WILLS, Bart., Langford Court Farm, Langford, near Bristol, red, **Collynie Rubicon** (179695), born 14th March, bred by W Duthie, Collynie, Aberdeenshire; s Marquis of Millhills (137868), d Rosebud 6th (Vol. 56, p. 820), s d Diamond King (83294).

II. (25.)—COL. F. RHODES, Brockhampton, Andorversford, Glos., white, **Pitsford Advocate** (183860), born 7th April, bred by G. H. Drummond, Pitsford Hall, Northampton; s Moresby Commodore (150662), d Augusta Eliza, s d Windsor Lad (113735).

III. (22.)—Ditto, ditto, roan, **Cotehay Guardsman** (179775), born 18th March; s Edgcote Hermit (130828), d Mysie Cruikshank 12th, s d Bertram (114284).

V.H.C.—MRS. E. JEWELL, Hendon Manor, Ide Hill, Sevenoaks, Kent, **Balcairn Norman** (178012), born 26th March, bred by T. L. Wallace, Balcairn, Oldmeldrum; s Bilsington Golden Harvest (154032), d Balcairn White Nonpareil (8760), s d Collynie Golden Knight (135619).

CLASS 75.—Shorthorn Bull, calved in 1923. [7 entries].

I. (£10.)—SIR G. A. WILLS, Bart., Langford Court Farm, Langford, near Bristol, dark roan, **Rickford Enchanter**, born 6th April; s Collynie Royal Regent (148043), d Eliza Lotus (Vol. 65, p. 1204), s d Marquis of Millhills (137868).

II. (£5.)—J. D. WILLIS, Bapton Manor, Codford, Wilts, red roan, **Bapton Chevalier**, born 2nd January, s Diamond Pierre (162773), d Celandine, s d Edgcote Courtier (130818).

III. (£2.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, roan, **Basildon Diamond**, born 4th January; s Cudham Moonlight (162593), d Princess Pat (Vol. 64, p. 1,390), s d Edgcote Courtier (130818).

V.H.C.—J. H. BURDGE, Park Farm, Yatton, dark roan, **Rickford Royal Blend**, born 25th February, bred by Sir G. A. Wills, Bart., Langford Court, Somerset; s Balcairn Cardinal (160945), d Rickford Butterfly, s d Golden Guardsman (125756).

CHAMPION PRIZE.

GIVEN BY THE SHORTHORN SOCIETY.

Best Bull in Classes 73 to 75, entered in, or eligible for entry in Coates's Herd Book, with Silver Medal to the Breeder.

I. (£10.)—SIR G. A. WILLS, Bart., Langford Court Farm, Langford, near Bristol, red, **Collynie Rubicon** (179695), born 14th March, bred by W. Duthie, Collynie, Aberdeenshire; s Marquis of Millhills (137868), d Rosebud 6th (Vol. 56, p. 820), s d Diamond King (83294).

R.—Ditto, ditto, dark roan, **Rickford Enchanter**, born 6th April; s Collynie Royal Regent (148043), d Eliza Lotus (Vol. 65, p. 1,204), s d Marquis of Millhills (137868).

DAIRY SHORTHORN.

(The First Prizes in Classes 76 and 77 (and a Silver Medal to the Breeder of the winners) were given by the Shorthorn Society in conjunction with the Dairy Shorthorn Association, and the First Prize in Class 80 by the Dairy Shorthorn Association.)

CLASS 76.—Pedigree Dairy Shorthorn Cow, in-Milk, calved in or before 1920, eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society or Association in 1923, milked in the Ring before judging, under Conditions 59. [12 entries].

I. (£10.)—MAJOR R. W. COOPER, M.C., Rush Court, Wallingford, red and little white, **Bessborough Orphan 6th**, born 15th September, 1917, bred by the Earl of Bessborough; s Bessborough Nestor (135121), d Bessborough Orphan 3rd, s d Keir Goldfinder (99249).

II. (25.)—CAPT. T. ALLEN-STEVENS, Wicklesham Lodge, Faringdon, Berks, **Long hill's Darlington**, born 26th, December, 1917, bred by E. A. Smith, Longhills, Lincoln; s Kelmescott Acrobat 9th (131660), d Darlington Norgrove, s d Cardinal Druid (108113). (Last calf, 22nd March, 1924).

III. (22.)—THE WEBBINGTON FARMS, LTD. (F. C. AND H. A. TIARKS, Directors), Webbington, Axbridge, Somerset, red roan, **Highworth Daisy 2nd** (Vol. 65, p. 674), born 19th May, 1918, bred by A. F. Chillingworth & Sons, Queenlains Farm, Highworth, Wilts; s Prince Seraphine (132848), d Daphne 10th, s d Kelmescott Tarquin 7th (109049). (Last calf 3rd March, 1924).

R.—W. C. SPENCER & SON, Bushley Park, Tewkesbury, roan, **Bonny 6th**, born 12th February, 1917, bred by Cumberland County Council, Newton Rigg, Penrith; s Underley Hero 31st (128603), d Red Bonny 2nd, s d Baron Elliott (114157).

H.C.—BENNETT & HOWARD, Quarry Farm, Thornbury, Glos., red and white, **Laura 45th**, born 23rd September, 1920, bred by R. W. Hobbs & Son, Kelmescott, Lechlade, Glos.; s Kelmescott Jester (149703), d Laura 37th, s d Creme de Menthe (110683).

CLASS 77.—*Pedigree Dairy Shorthorn Cow, in-Milk, calved in or after 1921, eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society or Association in 1923, milked in the Ring before judging, under Conditions 59.* [6 entries].

[NO AWARD].

(The Prizes in Class 78 were given by E. Ezra, Esq., of Lock, Partridge Green, Sussex).

CLASS 78.—*Dairy Shorthorn Pedigree Heifer, calved in 1923, eligible for and entered in Coates's Herd Book or pedigree sent for such entry previous to the Show, subject to Conditions No. 60*—[18 entries].

I. (210.)—SIR G. A. H. WILLS, Bart., Batsford Park, Moreton-in-Marsh, Glos., white, **Batsford Rosebud 2nd**, born 19th April; s Thornby Pioneer (133922), d Dolphinter Rosebud 8th (P.957), s d Dolphinter Linksman (111546).

II. (25.)—T. & S. BRAITHWAITE, Fieldgrove, Bitton, Glos., red and little white, **Fieldgrove Cressida 2nd**, born 11th January; s Kelmescott Conjuror 36th (164373), d Cressida 68th (Vol. 63, p. 1113), s d Empire Gift (125422).

III. (22.)—Ditto, ditto, red, **Fieldgrove Constance 2nd**, born 4th January; s Kelmescott Conjuror 36th (164373), d Lady Constance 4th (Vol. 65, p. 716), s d John Peel (137236).

R.—SIR G. A. H. WILLS, Bart, roan, **Batsford Cornhills Duchess 2nd**, born 22nd May; s Thornby Pioneer (133922), d Duchess of Cornhills 5th (P1110), s d Favourite Dalesman (108606).

H.C.—F. S. FRANCIS, Wilkin Throop Farm, Templecombe, roan, **Throop Duchess**, born 4th May; s Collescombe Dolphin, d Rockley Barrington Countess, s d Loobagh Dreadnought 4th.

C.—W. C. SPENCER & SON, Bushley Park, Tewkesbury, roan, **Bushlea Junella**, born 15th April; s Telluria Baron (167476), d Bushlea June, s d Babraham Priceless Boy (134778).

CLASS 79.—*Dairy Shorthorn Pedigree Bull, calved before 1923.*
[13 entries].

I. (£10).—R. N. TORY, Anderson, Blandford, roan, **Kelmscott Conjuror 3rd** (137269), born 12th June, 1916, bred by R. W. Hobbs & Sons, Kelmscott, Glos.; s Kelmscott Acrobat 4th (126217), d Helpmate 15th (Vol. 59, p. 755), s d Kelmscott Tarquin (105853).

II. (£5).—F. S. FRANCIS, Wilkin Throop Farm, Templecombe, roan, **Collescombe Dolphin**, born 24th May, 1921, bred by Mr. Miller, Bampton Oxford; s Knowsley Dolphin, d Combebank Coral, s d Foundation Stone.

III. (£2).—W. M. WILLS, Estate Office, Bracken Hill, Leigh Woods, Bristol, red and little white, **Primate's Heir**, born 22nd February, 1922, bred by F. H. Rea, Kite's Nest Farm, Wotton-under-Edge, Glos.; s Leam Primate (157155), d Christmas Rose, s d Pasture's Nonpareil (121929).

R.—R. FORTUNE, Newhouse, Cranleigh, Surrey, white, **Newhouse White Emperor** (174408), born 9th July, 1921; s Puddington King of Hearts 3rd (127509), d Rossall Golden Duchess 3rd (Vol. 63, p. 742), s d Golden Fortune (120449).

H.C.—CAPT. P. D. A. COURTENAY, Burnham-on-Sea, Somerset, roan, **Conjuror 2nd** (179738), born 23rd May, 1922, bred by G. D. Hibberd, Corfe Mullen, Wimborne; s Kelmscott Conjuror 3rd (137269), d Damory Barrington Duchess 4th (Vol. 61, p. 1076), s d Faithful Knight (95140).

CLASS 80.—*Dairy Shorthorn Pedigree Bull, calved in 1923, entered or pedigree accepted for entry in Coates's Herd Book, subject to Conditions No. 60.* [12 entries].

I. (£10).—T. AND S. BRAITHWAITE, Fieldgrove, Bitton, Glos., red and little white, **Fieldgrove Conjuror 8th**, born 3rd February; s Kelmscott Conjuror 36th (164373), d Valentine 25th, s d Dairy Ingram.

II. (£5).—SIR G. A. H. WILLS, Bart., Batsford Park, Moreton-in-Marsh, Glos.; roan, **Batsford Popcorn**, born 15th May; s Thornby Pioneer (133922), d Duchess of Cornhills 15th (11151), s d Gainford Recorder (123646).

III. (£2).—R. N. TORY, Anderson, Blandford, Dorset, roan, **Anderson Conjuror 14th**, born 26th March.; s Kelmscott Conjuror 3rd (137269), d Sherbornian Beauty (Vol. 65, p. 1223), s d Barrington Boy (118863).

R.—CAPT. T. ALLEN-STEVENS, Wicklesham Lodge, Faringdon, Berks, red, **Wicklesham Graceful Prince**, born 25th March; s Anderson Eagle (160735), d Grace Darling, s d Royal Briton (127869).

SPECIAL PRIZE.

GIVEN BY J. HOPE SIMPSON, Esq., M.P.

A Silver Cup for the best Dairy Shorthorn Cow exhibited by a resident in Somerset.

I.—THE WEBBINGTON FARMS, LTD. (F. C. AND H. A. TIARKS, Directors), Webbington, Axbridge, Somerset, red roan, **Highworth Daisy 2nd** (Vol. 65, p. 674), born 19th May, 1918, bred by A. F. Chillingworth & Sons, Queenlains Farm, Highworth, Wilts; s Prince Seraphine (132848), d Daphne 10th, s d Kelmscott Tarquin 7th (109049). (Last calf 3rd March, 1924).

HEREFORD

CLASS 81.—*Hereford Cow, in-Milk, calved before 1921.* [4 entries].

I. (£10).—O. WILLIAMS, Crossways, Cowbridge, Glamorgan, **Crossways Opal**, born 6th January, 1919; s Ringer (319202), d Sheepcote Opal, s d Milton (25571).

II. (£5).—T. L. WALKER, The Cedars, Broadwas-on-Teme, Worcester, **Ankerdine Agony**, born 3rd February, 1920; s Eaton Emperor (34912), d Agate, s d Bidney Laddie (32229).

III. (£2).—D. P. BARNETT, Walterston, Llancarfan, Cowbridge, **Lucy**, born 17th March, 1920; s Raffles (35505), d Shelsley Lucy (Vol. 51, p. 265), s d Eaton Sovereign (26832).

CLASS 82.—*Hereford Heifer, in-Milk, calved in 1921.* [1 entry].

I. (£10).—D. P. BARNETT, Walterston, Llancarfan, Cowbridge, **Snowdrop**, born 22nd January; s Walterston Sam (38309), d Dolesome (Vol. 50, p. 870), s d Sir Sam (33131).

CLASS 83.—*Hereford Heifer, calved in 1922.* [8 entries].

I. (£10).—O. WILLIAMS, Crossways, Cowbridge, Glamorgan, **Crossways Belle 2nd**, born 28th January; s Resolute (35537), d Bolinda 2nd, s d Lord Tarrington (29198).

II. (£5).—H. MORELAND, Marstow Court, Ross-on-Wye, Herefordshire, **Marstow Annie**, born 2nd January; s Prince (37743), d Bangle (Vol. 50, p. 675), s d Midshipman (26308).

III. (£2).—Ditto, ditto, **Marstow Ada**, born 10th January; s Prince (37743), d Piperall (Vol. 51, p. 502), s d Newton Major (32843).

R.—D. P. BARNETT, Walterston, Llancarfan, Cowbridge, **Lady 4th**, born 8th February; s Walterston Sam (38309), d Lady 3rd (Vol. 52, p. 199), s d Sailor Prince (26465).

H.C.—R. W. HALL & SON, Bidney, Dilwyn, Herefordshire, **Cotmore Candy Rattoo** (F.L.C.36), born 7th June; s Buckfield James (38705), d Rouge Alice (Vol. 50, p. 568), s d Shelsley Premier (28705).

C.—SIR D. R. LLEWELLYN, Bart., The Court, St. Fagans, near Cardiff, **Faith 3rd**, born 30th January, bred by H. P. Rees, Pantgesgallog, Sennybridge; s Eaton Peer (35810), d Faith, s d Leen Gloaming.

CLASS 84.—Hereford Heifer, calved in 1923. [8 entries].

I. (210.)—LORD CAWLEY, Berrington Hall, near Leominster, **Concertina**, born 5th January; s Aldersend Concrete (38263), d Concy (Vol. 45, p. 782), s d Weston Speculator (29453).

II. (25.)—H. MORELAND, Marstow Court, Ross-on-Wye, **Marstow Betty**, born 2nd January; s Bound's Justice (36106), d Piperall (Vol. 51, p. 502), s d Newton Major (32843).

III. (22.)—D. P. BARNETT, Walterston, Llancarfan, Cowbridge, **Mayberry**, born 27th April; s Walterston Sam (38309), d Hackberry (Vol. 52, p. 199), s d Tramp (28785).

R. and V.H.C.—SIR D. R. LLEWELLYN, Bart., The Court, St. Fagans, near Cardiff, **Molly 3rd**, born 29th January, bred by H. P. Rees, Pantgesgallog, Sennybridge; s Royal Boy (36786), d Molly, s d Hampton.

CHAMPION PRIZE.

GIVEN BY THE HEREFORD HERD BOOK SOCIETY.

Best registered Cow or Heifer in Classes 81 to 84.

I. (210.)—O. WILLIAMS, Crossways, Cowbridge, Glamorgan, **Crossways Belle 2nd**, born 28th January; s Resolute (35537), d Bolinda 2nd, s d Lord Tarrington (29198).

R.—D. P. BARNETT, Walterston, Llancarfan, Cowbridge, **Snowdrop**, born 22nd January; s Walterston Sam (38309), d Dolesome (Vol. 50, p. 870), s d Sir Sam (33131).

CLASS 85.—Hereford Bull, calved in 1920 or 1921. [2 entries].

I. (210.)—D. P. BARNETT, Walterston, Llancarfan, Cowbridge, **Apsam**, born 24th April, 1921; s Walterston Sam (38309), d Shelsley Lucy (Vol. 51, p. 265), s d Eaton Sovereign (26832).

II. (25.)—H. MORELAND, Marstow Court, Ross-on-Wye, Herefordshire, **Marstow Plum**, born 5th March, 1921; s Frome Star (31486), d Plum Tart (Vol. 49, p. 811), s d Lord Langston (29195).

CLASS 86.—Hereford Bull, calved in 1922. [1 entry].

I. (£10.)—O. WILLIAMS, Crossways, Cowbridge, Glamorgan, **Crossways Grovlute** (40768), born 1st March; s Resolute (35537), d Miss Grove 5th, s d Blair Athol (23296).

CLASS 87.—Hereford Bull, calved in 1923. [6 entries].

I. (£10.)—LORD CAWLEY, Berrington Hall, Leominster, **Red Man**, born 14th January; s Aldersend Concrete (38463), d Red Lady (Vol. 49, p. 407), s d Able King (20423).

II. (£5.)—J. MEDLICOTT, Court Farm, Bodenham, Herefordshire, **Bodenham Jonathan** (Vol. 54), born 9th February, bred by Mrs. Medlicott, Court Farm, Bodenham; s Bounds Joyful (36101), d Blossom 5th (Vol. 48, p. 776), s d Guardsman (27593).

III. (£2.)—Ditto, ditto, **Bodenham Energy** (Vol. 54), born 27th February, bred by Mrs. E. Medlicott, Court Farm, Bodenham; s Eaton Leader (40882), d Bodenham Doreen 5th (Vol. 50, p. 709), s d Admiral Gipsy (34527).

R.—W. H. WASS, Gattertop, Leominster, **Gattertop Chief**, born 13th January; s Salacious, d Clarice, s d Bodenham Chief.

CHAMPION PRIZE.

GIVEN BY THE HEREFORD HERD BOOK SOCIETY.

Best registered Bull in Classes 85 to 87.

I. (£10.)—D. P. BARNETT, Walterston, Llancarfan, Cowbridge, **Apsam**, born 24th April, 1921; s Walterston Sam (38309), d Shelsley Lucy (Vol. 51, p. 265), s d Eaton Sovereign (26832).

R.—O. WILLIAMS, Crossways, Cowbridge, Glamorgan, **Crossways Grovlute** (40768), born 1st March; s Resolute (35537), d Miss Grove 5th, s d Blair Athol (23296).

SUSSEX.

(£17 towards the Prizes in the Sussex Classes and the Silver Medals were offered by the Sussex Herd Book Society, but owing to Foot and Mouth Disease Restrictions the animals entered were prevented from being exhibited.)

CLASS 88.—Sussex Cow or Heifer, in-Milk, calved in or before 1921.
[3 entries].

CLASS 89.—Sussex Heifer, calved in 1922 or 1923. [4 entries].

SILVER MEDAL.

Best Cow or Heifer in Classes 88 or 89.

CLASS 90.—Sussex Bull, calved in 1921, 1922 or 1923. [3 entries].

SILVER MEDAL.

Best Bull in Class 90.

BRITISH FRIESIAN.

(£28 6s. 8d. towards the Prizes in the Friesian Classes were given by the British Friesian Cattle Society, and animals entered must have been registered in the B.F.C.S. Herd Book proper, those registered in Supplementary Section not being eligible).

CLASS 91.—*British Friesian Cow or Heifer, any age, in-Milk.* [16 entries].

I. (£10.)—G. HOLT-THOMAS, Northdean House, Hughenden, Bucks, **Northdean Meilboem P.I.** (47738), born 25th June, 1920; s Dell Hollander P.I. (7655), d Moordale (Imp.) Meilboem (18708), s d Max (5899 F.R.S.)

II. (£5.)—Ditto, ditto, **Brookside Bonnie Annie** (37514), born 7th March, 1919, bred by H. B. Cooke, Homewood Gate, Lewes, Sussex; s Petygards (Imp.) Bles Albert (4321), d Hedges Bonnie Annie (1698), s d Hedges Hawkrigg Duke (293).

III. (£2.)—Ditto, ditto, **Colton Sunray** (32650), born 31st October, 1918, bred by H. Brown, Colton Mains, Dunfermline; s Terling (Imp.) Vic Bertus (4541), d Colton Sunset (6868), s d Colton Puritan (95).

R.—G. T. EATON, Thurston Hall, Framfield, Sussex, **Thurston Ellen** (49368), born 26th April, 1920; s Kirkhill (Imp.) Karel 2nd (4051), d Kirkhill Nellie 3rd (18274), s d Colton Queen's Own (97).

V.H.C.—A. AND J. BROWN, Haydon Hill, Aylesbury, **Hedges Bles Julian** (39508), born 10th December, 1919; s Petygards (Imp.) Bles Albert (4321), d Hedges Queen Juliana (15024), s d Hedges Champion of Champions (271).

H.C.—H. M. MARTINEAU, The Lodge, Holyport, Berks, **Felhampton Joukje** (P.I.), born 22nd April, 1920, bred by J. Dale, Felhampton Court, Church Stretton, Salop; s Golf Botermijn 2nd (P.I.), d Rochford Grouwstra (P.I.), s d Rochford (Imp.), Johan.

C.—Ditto, ditto, **Cymric St. Martha**, born 24th January, 1917, bred by Lieut.-Col. G. R. Powell, Tynwydd, Hirevain, Glam.; s Cymric (Imp.), Frits, d Cymric St. Margaret, s d Melford Jester.—A. H. TARR, Westfield Farm, Chedzoy, Bridgwater, **Westfield Dinah** (49806), born 10th October, 1920; s Marsh Fume (6631), d Harston Letty (14952), s d Harston Botha (1393).

CLASS 92.—*British Friesian Heifer, not in-Milk, calved in 1922.* [6 entries].

I. (£10.)—G. T. EATON, Thurston Hall, Framfield, Sussex, **Thurston Karel Wallflower** (66890), born 5th July; s Kirkhill (Imp.) Karel 2nd (4051), d Knebworth Maria 2nd (9490), s d Knebworth Conjuror (361).

II. (£5.)—A. AND J. BROWN, Haydon Hill, Aylesbury, **Hedges John's Peggy** (62418), born 28th August; s Wigginton (Imp.) Johan (4637), d Moss Peggy (25790), s d Mos, (Imp.) Adema 49th (4223).

III. (22.)—G. HOLT-THOMAS, Northdean House, Hughenden, Bucks, **Northdean Wilhelminchen 2nd** (64810), born 7th March; s Dell Hollander (P.I. 7655), d Wigginton Wilhelminchen (23154), s d Wigginton Laird (2227).

R.—H. M. MARTINEAU, The Lodge, Holyport, Berks, **Holyport Trijntje 2nd** (P.I.), born 9th June; s Cragie Marthus 5th, d Holyport Trijntje 1st, s d Colonies Plaats Sailor Boy.

CLASS 93.—British Friesian Heifer, calved in 1923. [16 entries].

I. (210.)—A. AND J. BROWN, Haydon Hill, Aylesbury, **Hedges Johan's Violet**, born 21st February; s Wigginton (Imp.), Johan (4637), d Hedges Albert's Violet (39506), s d Petygard's (Imp.) Bles Albert (4321).

II. (25.)—G. T. EATON, Thurston Hall, Framfield, Sussex, **Thurston Karel Joyinripschaap 2nd**, born 7th January; s Kirkhill (Imp) Karel 2nd (4051), d Dunninald Joyinripschaap (38560), s d Dunninald (Imp.) Cæsar 2nd (3813).

III. (22.)—G. HOLT-THOMAS, Northdean House, Hughenden, Bucks, **Northdean Dieuwke** (P.I.), born 24th April; s Dell Hollander (P.I. 7655), d Northdean (Imp. 1922), Dieuwke (64782), s d Marten (806 S.A.S.B., 119/278 F.R.S.K.).

R.—G. T. EATON, **Thurston Karel Mimosa**, born 18th January; s Kirkhill (Imp.) Karel 2nd (4051), d Inwood Garland (39750), s d Rochford (Imp.) Johan (4399).

V.H.C.—H. M. MARTINEAU, The Lodge, Holyport, Berks, **Holyport Pearl**, born 13th April; s Kingswood Pluto, d Tyneside Pearl 2nd, s d Wigginton Friesland (P.I.).

H.C.—A. H. TARR, Westfield Farm, Chedzoy, Bridgwater, **Westfield Jewel**, born 30th September; s Demmage Frits (13675), d Westfield Ruby (58070), s d Mill Monarch (6699).

CLASS 94.—British Friesian Bull, calved in or before 1922. [4 entries].

I. 210.—E. SLINGER, Court Farm, Randwick, Stroud, Glos., **Mapleton Foreman**, born 20th June, 1921, bred by — Russel, Mapleton, Edenbridge, Kent; s Lavenham Janus (6559 P.I.), d Terling Skylark 10th (31184), s d Terling (Imp.) Vic Bertus (454).

II. (25.)—T. MANSFIELD, Winterbourne Court, Winterbourne, **Kingswood Ceres Champion** (17549), born 12th January, 1921, bred by H. Hale, Worthing; s Hedges Second Series (6427), d Kingswood Village Queen (37267), s d Kingswood (Imp.) Ynte (4047).

III. (22.)—W. H. PADFIELD, Canal Farm, Bathampton, Bath, **Bathampton Lascelles** (19277), born 28th February, 1922; s Glen Bravo Bushman (14111), d Knebworth Maud 2nd (15218).

xxxvi *Prizes awarded to British Friesian & Aberdeen-Angus Cattle.*

CLASS 95.—*British Friesian Bull, calved in 1923.* [6 entries].

I. (**£10.**)—G. T. EATON, Thurston Hall, Framfield, Sussex, **Thurston Karel Ranger**, born 28th July; s Kirkhill (Imp.) Karel (4051), d Horton Ro Deer (46098), s d Commuston (Imp.) Roland (3721).

II. (**£5.**)—G. J. LYSTER, The Manor Farm, Alresford, Hampshire, **Brislington Peter**, born 23rd February, bred by G. Bishop, Scotland Farm, Brislington, Bristol; s Cymric Mars (7637), d Terling Ross 10th (22922), s d Terling Millionaire (3241).

III. (**£2.**)—A. ALLEN, The Manor, Chesterblade, Somerset, **Hedges Prince Jan**, born 7th June, bred by A. and J. Brown, Haydon Hill, Aylesbury; s Wigginton (Imp.) Johan (4637), d Hedges Gracious Dutch (24952), s d Hedges (Imp.) Fokke 2nd (3993).

ABERDEEN-ANGUS.

(£20 towards the Prizes in the Aberdeen-Angus Classes were given by the English Aberdeen-Angus Cattle Association).

CLASS 96.—*Aberdeen Angus Cow or Heifer, in-Milk, calved before 1st December, 1921.* [6 entries].

I. (**£10.**)—J. J. CRIDLAN, Maisemoor Park, Gloucester, **Pride of Maisemoor 22nd** (69158), born 7th February, 1921; s George R. of Ballindalloch (30611), d Pride of Maismore 19th (64341), s d Idylle of Maismore (36219).

II. (**£5.**)—F. H. TURNBULL, Lower House Farm, Llantwit Major, **Esta Erica** (70339), born 5th March, 1921, bred J. N. Rae, Mounthooly, Rosehearty; s Eventoir of Ballindalloch (36045), d Estimate (64691), s d Evinco of Ballindalloch (41555).

III. (**£2.**)—C. W. SOFER WHITBURN, Amport St. Mary's, Andover, Hants, **Erina of Curragh** (62535), born 24th December, 1917, bred by Capt. Greer, The Curragh, Ireland; s Peeler of Curragh, d Erna of Curragh, s d Legion of Curragh.

R.—E. A. WIGAN, Conholt Park, Andover, Hants, **Ellenora of Conholt** (66089), born 23rd February, 1919; s Ether of Bleaton (39535), d Eldorado of Balthayock (45568), s d Ethiopian of Balthayock (25594).

H.C.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Kriela** (72311), born 29th January, 1921, bred by J. Grant, Ballisfurth, Grantown; s Gladiator of Dupplin (43763), d Keturah of Finlarig (42221), s d Edelfhof (20416).

C.—R. P. EVANS, Woodhatch House, Reigate, **Euthalla 2nd of Byres** (62813), born 3rd April, 1918, bred by J. McDonald, Byre, Lochabers; s En Avant (39408), d Euthalla of Byres (40840), s d Polo of Coyrachie (35014).

CLASS 97.—*Aberdeen-Angus Heifer, calved on or after 1st December, 1921. [5 entries].*

I. (210).—J. J. CRIDLAN, Maisemore Park, Gloucester, **Jilt 9th of Maisemore** (71428), born 12th January, 1922 ; s George R. of Ballindalloch (30611), d Jilt 8th of Maisemore (66763), s d Prince of Salem (31112).

II. (25).—H. C. VENNING, Willett, Bicknoller, Taunton, **Elysia of Willett**, born 13th January, 1922 ; s Floran of Langshott, d Elysia of Bywell 5th, s d Endrick Prince.

III. (22).—F. H. TURHBULL, Lower House Farm, Llantwit Major, **Black Bara** (70968), born 24th January, 1922, bred by D. M. Allen, Ballintomb, Crantown-on-Spey ; s Evendale of Bleaton (48139), d Blackskin of Ballintomb (54609), s d George R. of Ballindalloch (30611).

H.C.—Ditto, ditto, **Euretta of Ballintomb** (70971), born 3rd March, 1922, bred by D. M. Allen, Ballintomb, Crantown-on-Spey ; s Pundit of Moyness (49137), d Euretta of Whiteside 5th (67096), s d Gironda of Ballindalloch (41659).

C.—R. P. EVANS, J.P., Woodhatch House, Reigate, Surrey, **Joyce of Langshott 3rd** (73603), born 8th December, 1922, bred by J. H. Bridges, J.P., Langshott, Horley, Surrey ; s Elector of Auchterardes (45580), d Jovrilla (60323).

CLASS 98. *Aberdeen-Angus Heifer, calved on or after 1st December, 1922. [12 entries].*

I. (210).—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Elite of Basildon**, born 5th December, 1922 ; s Baron Eros of Bleaton (47225), d Evileric (58364), s d Junior Eric (34725).

II. (25).—C. W. SOFER WHITBURN, Ampport St. Mary's, Andover, Hants, **Blackbird of Ampport**, born 2nd December, 1922 ; s Euraylus of Ballindalloch (48123), d Blackbird of Grymsdyke (59827), s d Estor of the Temple (34467).

III. (22).—Ditto, ditto, **Black Bell of Ampport**, born 11th December, 1922 ; s Jovial Eric (39863), d Black Bell of Dalmeny (57130), s d Heather Hero of Dalmeny (34618).

R.—J. J. CRIDLAN, Maisemore Park, Gloucester, **Pride 25th of Maisemore** (73797), born 28th December, 1922 ; s George R. of Ballindalloch (30611), d Pride 21st of Maisemore (69157), s d Everjilt of Maisemore (45868).

V.H.C.—Ditto, ditto, **Evergreen 98th** (73796), born 25th March, 1923 ; s George R. of Ballindalloch (30611), d Evergreen 33rd (54031), s d Brave Briton of Maisemore (30218).

H.C.—H. C. VENNING, Willett, Bicknoller, Taunton, **Priceless of Willett**, born 12th April, 1923 ; s Zodiac of Willett, d Bywell Pride, s d Meteor of Apethorpe.

C.—R. P. EVANS, J.P., Woodhatch House, Reigate, Surrey, **Jill of Woodhatch** (73067), born 10th January, 1923, bred by J. M. Young, Horsie Land Farm, Newdigate, Surrey; s Jurin of Langshott (50859), d Jill of Preston 4th (50215).

CLASS 99.—*Aberdeen-Angus Bull, calved before 1st December, 1922.*
[5 entries].

I. (210.)—J. J. CRIDLAN, Maisemore Park, Gloucester, **Everdear of Maisemore** (45859), born 18th February, 1919; s Evercalm (33167), d Evergreen 39th (58018), s d Black Boy of Maisemore (35554).

II. (25.)—H. C. VENNING, Willett, Bicknoller, Taunton, **Glozer of Candacraig**, born 15th May, 1922, bred by F. L. Wallace, Candacraig, N.B.; s Ego (41252), d Gloriette of Ballindalloch, s d Elorus of Ballindalloch.

III. (22.)—E. A. WIGAN, Conholt Park, Andover, Hants, **Behemah of Bleaton** (51799), born 4th March, 1922, bred by Marshall & Mitchell, Bleaton, Blairgowrie; s Emptor of Bleaton (47936), d Beloved Maid of Bleaton (67727), s d Esquire of Harviestoun (43583).

H.C.—C. W. SOFER WHITBURN, Amport St. Mary's, Hants, **Euryalus of Ballindalloch** (48123), born 30th April, 1920, bred by Sir G. A. Grant, Ballindalloch; s Jorum of Ballindalloch (43920), d Eurica (50786), s d Everarol of Ballindalloch (21902).

CLASS 100.—*Aberdeen-Angus Bull, calved on or after 1st December, 1922.* [8 entries].

I. (210.)—H. C. VENNING, Willett, Bicknoller, Taunton, **Plasmon of Willett**, born 10th December, 1922; s Floran of Langshott, d Plasma 3rd of Frampton, s d General Picton.

II. (25.)—C. W. SOFER WHITBURN, Amport St. Mary's, Andover, Hants, **Primate of Amport**, born 5th December, 1922; s Euryalus of Ballindalloch (48123), d Pride of Multen 42nd (54703), s d Eclipse of Ballindalloch (26733).

III. (22.)—W. R. BOARD, Great Frampton, Llantwit Major, Cardiff, **Pasman** (55431), born 24th December, 1922; s General Picton (45985), d Plasma 2nd of Frampton (64086), s d Moose (34877).

R.—F. H. TURNBULL, Lower House Farm, Llantwit Major, **Elsinore of Llantwit** (54501), born 25th January, 1923; s George R. of Ballindalloch (30611), d Evergreen 68th (66757), s d Idyll of Maisemore (36219).

C.—R. P. EVANS, J.P., Woodhatch House, Reigate, Surrey, **Estate of Langshott**, born 10th January, 1923, bred by J. H. Bridges, J.P., The Court, Eastbourne, Sussex; s Earl of Surrey (43238), d Esterel 17th of Langshott (61810).—Ditto, ditto, **Elver of Langshott** (54506), born 1st January, 1923, bred by J. H. Bridges, J.P., The Court, Eastbourne, Sussex; s Earl of Surrey (43238), d Electa 5th (52724), s d Bollinger (35591).

CHAMPION PRIZES.

GIVEN BY THE ABERDEEN-ANGUS CATTLE SOCIETY.

A Silver Medal for the Best Animal in Classes 96 to 100.

I.—J. J. CRIDLAN, Maisemore Park, Gloucester, **Jilt 9th of Maisemore** (71428), born 12th January, 1922; s George R. of Ballindalloch (30611), d Jilt 8th of Maisemore (66763), s d Prince of Salem (31112).

R.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Elite of Basildon**, born 5th December, 1922; s Baron Eros of Bleaton (47225), d Evileric (58364), s d Junior Eric (34725).

GIVEN BY THE ENGLISH ABERDEEN-ANGUS CATTLE ASSOCIATION.

A Silver Medal for the Best Animal of opposite sex.

I.—J. J. CRIDLAN, Maisemore Park, Gloucester, **Everdear of Maisemore** (45859), born 18th February, 1919; s Evercalm (33167), d Evergreen 39th (58018), s d Black Boy of Maisemore (35554).

R.—H. C. VENNING, Willett, Bicknoller, Taunton, **Plasmon of Willett**, born 10th December, 1922; s Floran of Langshott, d Plasma 3rd of Frampton, s d General Picton.

GIVEN BY THE ARGENTINE ABERDEEN-ANGUS ASSOCIATION.

A Silver Medal for the best Animal in Classes 96 to 100, bred by the Exhibitor.

I.—J. J. CRIDLAN, Maisemore Park, Gloucester, **Everdear of Maisemore** (45859), born 18th February, 1919; s Evercalm (33167), d Evergreen 39th (58018), s d Black Boy of Maisemore (35554).

R.—Ditto, ditto, **Jilt 9th of Maisemore** (71428), born 12th January, 1922; s George R. of Ballindalloch (30611), d Jilt 8th of Maisemore (66763), s d Prince of Salem (31112).

CHALLENGE CUP.

GIVEN BY THE ENGLISH ABERDEEN-ANGUS ASSOCIATION.

The Venning Cup for the Exhibitor gaining the most points in the Aberdeen-Angus Classes on the basis of four points for a first prize, three points for a second, two points for a third, one point for a Reserve, two points for a Championship, and one point for a Reserve Championship. The Cup to be won twice in succession or three times in all before becoming the property of the Exhibitor.

I.—J. J. CRIDLAN.

RED POLL.

(£20 towards the Prizes in the Red Poll Classes were given by the Red Poll Cattle Society).

CLASS 101.—Red Poll Cow or Heifer, in-Milk, calved before 1922.
[9 entries].

I. (£10.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Sudbourne Comfit** (25965), born 10th August, 1916, bred by K. Clarke, Sudbourne Hall, Orford, Suffolk; s Sudbourne Credit (10796), d Sudbourne Comfort (22355), s d Sudbourne Spicy (9751).

II. (£5.)—LORD BLEDISLOE, K.B.E., Lydney Park, Glos., **Plumstead Patience** (25829), born 2nd September, 1915, bred by Major W. J. Astley, Little Plumstead Hall, Norwich; s Morham Alert (10338), d Brookhill Buttercup, s d Honingham Alby (9700).

III. (£2.)—MAJOR J. G. DUGDALE, Whiteway Farm, Cirencester, **Framlingham Proud Lass**, born 21st November, 1918, bred by W. Woodgate, Eyke, Woodbridge; s Sudbourne Crossbow (10928), d Worlingworth Proud Girl (24927), s d Worlingworth Red Ensign (10692).

E.—LORD BLEDISLOE, K.B.E., Lydney Park, Glos., **Herontye Lucinda** (28889), born 6th March, 1919, bred by A. Devitt, Sussex; s Colworth Sorcerer, d Rendlesham Royal Lucy, s d Davyson 265th (9230).

H.C.—Ditto, ditto, **Brownslade Spicy**, born 23rd April, 1920, bred by P. O. Lambton, Brownslade, Pembroke; s Hatton Guardian (11155), d Brownslade Sunflower (26077), s d Mustard (10462).

C.—MAJOR J. A. MORRISON, D.S.O., **Basildon Clara**, born 3rd April, 1920; s Sudbourne Miner (11492), d Brightwell Clinker (23906), s d Sir David (10363).

CLASS 102.—Red Poll Heifer, calved in 1922. [2 entries].

I. (£10.)—MAJOR J. G. DUGDALE, Whiteway Farm, Cirencester, **Kirton Unity**, born 15th January, bred by W. F. Paul, Kirton Lodge, Ipswich; s Sudbourne Forerunner (11491), d Sudbourne Prize (22375), s d Sudbourne Sirdar (9871).

CLASS 103.—Red Poll Heifer, calved in 1923. [6 entries].

I. (£10.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Basildon Wonder Pear**, born 23rd January; s Basildon Orpheus (11557), d Colworth Wistful (28628), s d Plumstead Periscope (11188).

II. (£5.)—MRS. M. M. FITZGERALD, Marsden Manor, Cirencester, **Antwick Christobel**, born 12th February, bred by Major H. Colmore, Papillin Hall, Market Harborough; s Knepp Ajax (11397), d Harefield Alistine, s d Sudbourne Crown Prince (10503).

III. (22.)—Miss M. SWORD, Westcombe Farm, Evercreech, **Shaw Hill Amber**, born 9th February, bred by D. Floyd, Shaw Hill, Melksham ; s Bredfield Royal, d Albyns Lady 2nd, s d Albyns John (10514).

C.—Ditto, ditto, **Westcombe Beryl**, born 14th March ; s Bredfield Regal, d Bredfield Rose, s d Davyson 265th.

CLASS 104.—*Red Poll Bull, calved in or before 1922.* [2 entries].

I. (210.)—A. W. SALE, Gables Farm, Rotherfield, Sussex, **Hillcote Hercules** (12667), born 11th October, 1922, bred by Capt. Beale, Hillcote Farm, Purley, Pangbourne, Berks ; s Aspoll Eros 2nd (11093), d Kettleborough Ruby 13B (22638), s d Kettleborough Majiolini (10042).

CLASS 105.—*Red Poll Bull, calved in 1923—First prize, £10—second, £5—third, £2.* [2 entries].

[No EXHIBIT.]

WELSH BLACK.

(£10 towards the Prizes in the Welsh Black Classes were given by the Welsh Black Cattle Society, and £15 by Sir Geo. Meyrick, and animals must have been registered or eligible for registration in the Welsh Black Cattle Herd Book.)

CLASS 106.—*Welsh Black Cow or Heifer, in-Milk, calved on or before November 30th, 1921.* [4 entries].

I. (210.)—SIR G. A. E. T. G. MEYRICK, Bart., Bodorgan Hall, Isle of Anglesey, and Hinton Admiral, Christchurch, Hants, **Mair 2nd** (1831), born 10th November, 1912, bred by Lord Penrhyn, Penrhyn Castle, North Wales ; s Duke of Wellington (294), d Mair (388).

II. (25.)—S. H. JENKS, Pilsdon Manor Farm, near Bridport, Dorset, **Bute Miss Arfon** (3174), born 1st January, 1915, bred by the Marquis of But, Cardiff Castle, Cardiff ; s Stanley (954), d Miss Arfon (1252), s d Pentyoch Cawr (342).

III. (22.)—SIR G. A. E. T. G. MEYRICK, Bart., **Bodelwa Sally 2nd** (5025), born 4th December, 1920, bred by O. E. Hughes, Bodelwa, Tycores, Isle of Anglesey ; s Bodelwa Volunteer (1273), d Bodelwa Mona Bach (3362).

CLASS 107.—*Welsh Black Heifer, calved on or between December 1st, 1921, and November 30th, 1922.* [7 entries].

I. (210.)—SIR G. A. E. T. G. MEYRICK, Bart., Bodorgan Hall, Isle of Anglesey, and Hinton Admiral, Christchurch, Hants, **Bodelwa Mona 2nd** (5852), born 1st December, 1921, bred by O. E. Hughes, Bodelwa, Tycores, Isle of Anglesey ; s Bodelwa Volunteer (1273), d Bodelwa Mona Bach (3362).

II. (25).—A. W. WILLMER, Waen, Dolgelley, also Trafford Hall, near Chester, **Waen Buttercup**, born 5th June, 1922 ; s Sion 'or Bryn (1769), d Waen Martha (3871), s d Blodgorn (1145).

III. (22).—Ditto, ditto, **Waen Fairy 2nd** (Vol. 11), born 6th September, 1922 ; s Sion 'or Bryn (1769), d Waen Fairy (4757), s d Herald of Penrhyn (1143).

R.—J. C. GRAHAM, Clwyd Hall, Ruthin, **Ystwyth Oyster** (6214), born 28th August, 1922, bred by Colonel Pugh, Lovesgrove Farm, Aberstwyth ; s Bodelwa Volunteer (1273), d Tregarn Orchis (4533), s d Stamp of Penryhn (1132).

H.C.—Ditto, ditto, **Bryniog 2nd of Halford**, born 3rd March, 1922, bred by Allen & Rogers, Craven Arms ; s Trefor Togo (1483), d Bryniog 14th (3795), s d Wern Quota (993).

CLASS 108.—*Welsh Black Heifer, calved on or between December 1st, 1922, and November 30th, 1923.* [2 entries].

I. (210).—SIR G. A. E. T. G. MEYRICK, Bart., Bodorgan Hall, Isle of Anglesey, and Hinton Admiral, Christchurch, Hants, **Bodorgan Blodwen**, born 17th January, 1923 ; s Penmyndd Gaswallon (2062), d Bodelwa Shan 3rd (4158), s d Bodelwa Volunteer (1273).

II. (25).—J. C. GRAHAM, Clwyd Hall, Ruthin, **Cim Beauty**, born 1st January, 1923, bred by J. W. Holland, Punt-y-Gwair, Abersoch ; s Cim Chamberlain (1908), d Cim Sarah (5000), s d Lord Roberts (921).

CLASS 109.—*Welsh Black Bull, calved on or before November 30th, 1922.* [2 entries].

I. (210).—SIR G. A. E. T. G. MEYRICK, Bart., Bodorgan Hall, Isle of Anglesey, and Hinton Admiral, Christchurch, Hants, **Bodelwa Ap Volunteer**, born 2nd December, 1921, bred by O. E. Hughes, Bodelwa, Tycroes, Isle of Anglesey ; s Bodelwa Volunteer (1273), d Bodelwa Mair (2679), s d Madryn King (493).

II. (25).—J. C. GRAHAM, Clwyd Hall, Ruthin, **Snowdon Emlyn** (1477), born 4th May, 1919, bred by University College Farm, North Wales ; s Snowdon Emperor (1193), d Snowdon Rose (1923), s d Wern Emperor (501).

CLASS 110.—*Welsh Black Bull, calved on or between December 1st, 1922, and November 30th, 1923.* [4 entries].

I. (210).—SIR G. A. E. T. G. MEYRICK, Bart., Bodorgan Hall, Isle of Anglesey, and Hinton Admiral, Christchurch, Hants, **Ystwyth Predominant**, born 18th February, 1923, bred by the late Col. A. J. Pugh, O.B.E., V.D., Lovesgrove, Aberystwyth ; s Bodelwa Volunteer (1273), d Lady Newydd 1st (3153), s d Glyn Togo (934).

II. (25).—A. W. WILLMER, Waen, Dolgelley, also Trafford Hall, near Chester, **Waen Gordon** (Vol. 12), born 10th August, 1923 ; s Northgate Boy (2040), d Waen Martha (3871), s d Blodgorn (1145).

III. (22.)—S. H. JENKS, Pilsdon Manor Farm, near Bridport, **Pilsdon Brigadier**, born 3rd March, 1923; s Madryn Leo (1404), d Bachellyn Omaha (2356), s d Bachellyn Lucifer (615).

R.—Ditto, ditto, **Pilsdon Aristotle** (48), born 1st December, 1922, s Madryn Leo (1404), d Rorsedd Dwsî 3rd (2537), s d Madoc Dick (784).

AYRSHIRE.

(£10 towards the Prizes in the Ayrshire Classes were given by the English Committee of the Ayrshire Cattle Herd Book Society).

CLASS 111.—*Ayrshire Cow, in-Milk, calved in or before 1921.* [7 entries].

I. (210.)—EARL OF EGLINTON AND WINTON, Horn's Lodge, Tonbridge, **Eglintonmains Dainty** (58016), born 28th January, 1918; s Eglintonmains Look Alive (14319), d Eglintonmains Scotch Lady (38659), s d Whitehill Royal Scott (10401).

II. (25.)—LIEUT.-COL. R. E. CECIL, D.S.O., Passford House, Lymington, Hants, **Auchenbrain Yellow Kate 20th** (57348), born 30th April, 1919, bred by D. Wallace, Auchenbrain, Mauthline, N.B.; s Auchenbrain Sunlight (15832), d Auchenbrain Yellow Kate 7th (28674), s d Lessnessock Good Gift (7368).

III. (22.)—Ditto, ditto, **Eglintonmains Blossom** (68323), born 2nd October, 1919, bred by the Earl of Eglinton and Winton, Horn's Lodge, Tonbridge, Kent; s Eglintonmains Look Alive (14319), d Eglintonmains Red Rose (58035), s d Howie's Regal Record (14090).

R.—EARL OF EGLINTON AND WINTON, **Eglintonmains Dinah** (68324), born 27th December, 1919; s Howie's Braw Lad (16970), d Eglintonmains Nina (38657), s d Drumsuie Sir Robert (7805).

CLASS 112.—*Ayrshire Heifer, calved after 1921.* [4 entries].

I. (210.)—EARL OF EGLINTON AND WINTON, Horn's Lodge, Tonbridge, **Eglinton Flame** (87844), born 12th February, 1922; s Bagenock Casabianca (15250), d Eglintonmains Glamour (58020), s d Howie's Regal Record (14090).

II. (25.)—LIEUT.-COL. R. E. CECIL, D.S.O., Passford House, Lymington, Hants, **Passford Candlemas** (86830), born 3rd February, 1922, bred by J. Logan, Bagenock, Coylton, N.B.; s Bagenock Standard Bearer (19758), d Bagenock May Blossom 3rd (36990), s d Bagenock Magnificent (9579).

III. (22.)—G. C. HAYES, The Greenway, Sturdington, Cheltenham, **Greenway Fiery**, born 9th December, 1922; s Dalfibble Twinkling Star (19815), d Grange Firefly 7th (76052), s d Benchan High Degree (12533).

R.—Ditto, ditto, **Greenway Ariel**, born 17th December, 1922; s Dalfibble Twinkling Star (19815), d Grange Muriel 3rd (58093), s d Hartburn Reserve (11639).

JERSEY.

(The Prizes in Class 113 were given by the English Jersey Cattle Society).

CLASS 113.—*Jersey Cow or Heifer, in-Milk, entered in or eligible for entry in the English Jersey Herd Book, sired in Great Britain or Ireland.* [16 entries].

I. (25.)—MRS. EVELYN, Wotton House, Dorking, nearly whole, **Wotton Queen of Clubs**, born 24th March, 1921; s Acre's Prince, d Wotton Margaret (Vol. 28, p. 364), s d Yeovil Lad (10833).

II. (23.)—R. B. WARD, Godinton, Ashford, Kent, whole, **Evergreen**, born 4th September, 1906, bred by Countess Roberts, Englemere; s Catillon's Prince (11639), d Etiquette, s d Fleur de Lys (9583).

III. (22.)—MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, whole, **Rapkyms Perfection** (Vol. 33), born 19th April, 1921, bred by W. D. Knight, Rapkyms, Horsham, Sussex; s Rapkyms Black Knight (13716), d Rapkyms Perfume (Vol. 33), s d Structure (12773).

R. and V.H.C.—SIR G. S. WHITE, Bart., Hollywood Tower, near Bristol, broken, **Peace of Hollywood**, born 18th July, 1919; s Pepper, d Daisy of Hollywood, s d Client.

V.H.C.—G. CROSS, Smart's Hill House, Penshurst, Kent, whole, **Gloxalia 2nd**, born 19th March, 1921, bred by C. Taylor, Ninehams, Caterham, Surrey; s King Capsicum, d Gloxalia, s d Fairy Duc.

H.C.—G. BERRY, Mount Bures, Bures, S.O., Suffolk, whole, **Golden Raspberry**, born 29th December, 1920; s Golden Bilberry, d Raspberry, 2nd, s d Verdum.—G. CROSS, Smart's Hill House, Penshurst, Kent, whole, **Miss Etiquette**, born 2nd January, 1921, bred by Mrs. Rudd, Newchapel House, Lingfield, Surrey; s Fire King, d So Lady Like, s d Vale Lily's Lad.—MRS. EVELYN, Wotton House, Dorking, black, **Fairlawne Hussey**, born 8th August, 1916, bred by W. M. Cazalet, Tonbridge; s SirToby (12154), d Hussey 13th (Imp.), s d MacDougal.

C.—MRS. EVELYN Wotton House, Dorking, **Wotton Relustria**, born 11th July, 1917; s Illustrious, d Record 3rd (Vol. 21, p. 406), s d Astor (3042).—R. B. WARD, whole, **Prometheus Queen**, born 20th November, 1919; s Prometheus (13391), d Mulcaster's Queen, s d Mulcaster (12399).

CLASS 114.—*Jersey Cow, in-Milk, calved before 1921.* [21 entries].

I. (210.)—MRS. EVELYN, Wotton House, Dorking, black, **Limberlost**, born 25th February, 1917, bred by C. W. Blampied, Trinity, Jersey; s Dame's Gamboge, d Peggy's Daisy.

II. (25.)—G. CROSS, Smart's Hill House, Penshurst, Kent, broken, **Roberta's Star 2nd**, born 15th October, 1920, bred by J. Laurens, St. Lawrence, Jersey; s Sybil's Gamboge 3rd, d Roberta's Star, s d Kingsway.

III. (22.)—R. B. WARD, Godinton, Ashford, Kent, whole, **Evergreen**; born 4th September, 1906, bred by Countess Roberts, Englemere; s Catillon's Prince (11639), d Etiquette, s d Fleur de Lys (9583).

B. and V.H.C.—C. L. HILL, Harptree Court, East Harptree, broken, **Queen of Peace**, born 1st December, 1918, bred by A. E. Baudains; s Oxford's Fern's Hope (5496 H.C., 13373), d Dolly Vardon (14880 C.), s d Alfriston Duke (H.C.4029).

V.H.C.—MRS. O. AMES, Blackdown, Upham, Southampton, grey fawn, **Park Mayfire**, born 4th May, 1917, bred by P. Slow, St. Hiliers, Jersey; s The Cid (12473), d Firelight 2nd (12911 P.S.H.C.), s d Billy Bowsprit (8433).—Ditto, ditto, light fawn, **Fairy Winks**, born 4th December, 1917, bred by J. P. le Marquard, St. Ouen's, Jersey; s Fairy General (12609), d Financial Winks (22049), s d Financial Baron (11310).—MRS. H. BRIGGS, The Grange, Northstoke, near Wallingford, Berks, whole, **Petune's Victory**, born 26th August, 1918, bred by R. Hervie, St. Lawrence, Jersey; s Petune's Lad, d Running Water, s d Anemone's Ledas Lad.—MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, broken, **Reading Choice** (Vol. 32), born 4th May, 1918, bred by Mrs. J. Rebindaine, St. Mary's, Jersey; s Muto (12720), d Reading Fair (22430), s d Golden Fern's Noble (10626).

H.C.—SIR G. S. WHITE, Bart, Hollywood Tower, near Bristol, broken, **Peace of Hollywood**, born 18th July, 1919; s Pepper, d Daisy of Hollywood, s d Client.—G. CROSS, whole, **So Lady Like**, born 22nd May, 1917, bred by S. Le Masuries, Jersey; s Vale Lily's Lad, d So Lite (F.S.C.).—Ditto, ditto, whole, **Eastern Queen Laxton**, born 15th February, 1917, bred by J. A. Gebaut, Trinity, Jersey; s Dame's Gamboge, d Western Queen Laxton, s d Western King.—COLONEL L. GISBORNE, C.M.G., Lingen Hall, Brampton Bryan, whole, **Deliverance**, born 11th September, 1918, bred by G. England, Grouville, Jersey; s La Sente's King Onyx (13630), d Moirette (22902), s d Fern's Oxford Noble (11684).—E. A. STRAUSS, Kingston House, Abingdon, Berks, whole, **Sultan's Remembrance 6th**, born 16th March, 1914, bred by E. Mathews, C.V.O., Little Shardeloes, Amersham, Bucks; s Noble Sultan of Oaklands (110), d Remembrance 9th, s d Carnation Crown (6493).

C.—COLONEL L. GISBORNE, C.M.G., whole, **Mercede's Maid** (26278), born 5th September, 1918, bred by J. de Greechy, Trinity, Jersey; s Oxford's Fern's Hope (5496), d Mercede's Fern (23726), s d Fern's Oxford Noble (5012).

CLASS 115. Jersey Cow or Heifer, in-Milk, calved in 1921. [13 entries].

I. (210.)—MRS. EVELYN, Wotton House, Dorking, nearly whole, **Wotton Queen of Clubs**, born 24th March, 1921; s Acre's Prince, d Wotton Margaret (Vol. 28, p. 364), s d Yeovil Lad (10833).

II. (§5.)—MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, whole, **Rapkyns Perfection** (Vol. 33), born 19th April, 1921, bred by W. D. Knight, Rapkyns, Horsham, Sussex; s Rapkyns Black Knight (13716), d Rapkyns Perfume (Vol. 33), s d Structure (12773).

III. (§2.)—R. B. WARD, Godinton, Ashford, Kent, whole, **Philandra**, born 20th November, 1921; s Pilgrim (13699), d Miranda's Lass, s d Marionette's Lad (13351).

R. and V.H.C.—MRS. O. AMES, Blackdown, Upham, Southampton, whole, **Meriel**, born 14th January, 1921, bred by P. le Blancq, St. Clements, Jersey; s La Glorie Cid (13626), d Timbuctoo's Pride (25220), s d St. Julian (13748).

H.C.—G. CROSS, Smart's Hill House, Penshurst, Kent, whole, **Gloxalia 2nd**, born 19th March, 1921, bred by C. Taylor, Ninehams, Caterham, Surrey; s King Capsicum, d Gloxalia, s d Fairy Duc.

C.—Ditto, ditto, whole, **Miss Etiquette**, born 2nd January, 1921, bred by Mrs. Rudd, Newchapel House, Lingfield, Surrey; s Fire King, d So Lady Like, s d Vale Lily's Lad.—C. L. HILL, Harptree Court, East Harptree, whole, **Harptree Dolly**, born 14th January, 1921; s Pekin (13697), d Dolly's Choice (Vol. 32, p. 313), s d Dolly's Son (12914).—E. A. STRAUSS, Kingston House, Abingdon, Berks, whole, **Kingston Bunt**, born 29th April, 1921; s Knight of Beechwood, d Rokeby Elizabeth, s d Sailor Boy.

CLASS 116.—*Jersey Heifer, in-Milk, calved in or since 1922.* [15 entries].

I. (§10.)—R. B. WARD, Godinton, Ashford, Kent, whole, **Leda**, born 29th March, 1922; s Paladin, d Ida, s d Antidote (10843).

II. (§5.)—MRS. EVELYN, Wotton House, Dorking, whole, **Wotton Breeze**, born 12th May, 1922; s Henbury Moonlight (13301), d Wotton Windlass (Vol. 30, p. 402), s d Red Cloud (11818).

III. (§2.)—COLONEL L. GISBORNE, C.M.G., Lingen Hall, Brampton Bryan, whole, **Lingen Maid of Orleans**, born 14th March, 1922; s Young Masterstroke (14516), d Deliverance (Vol. 33, p. 306), s d La Sente's King Onyx (13630).

R. and V.H.C.—SIR. G. S. WHITE, Bart, Hollywood Tower, near Bristol, dark fawn, **Freda of Hollywood**, born 16th January, 1922; s Pioneer's Victory of Hollywood, d Freesia of Hollywood, s d Hero of Hollywood.

H.C.—G. BERRY, Mount Bures, Bures S.O., Suffolk, whole, **Post-mistress**, born 23rd January, 1922; s Lord Blackberry, d Postage 2nd, s d Verdun. MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, whole, **Night Scented Rose**, born 11th June, 1922, bred by J. le Sueur, St. Saviour's; s Cornish Cid (5662), d Night Scented Stock (25549), s d The Cid.—R. B. WARD, whole, **Philomel**, born 26th April, 1922; s Pilgrim (13699), d Beau Souvenir, s d Blazer (13491).—SIR G. S. WHITE, Bart, light fawn, **Pink of Hollywood**, born 5th June, 1922; s Beuvelande Emperor, d Mon Plaisirs Princess, s d General Cowslip.

G.—MRS. O. AMES, Blackdown, Upham, Southampton, dark fawn, **Queen's Rosie**, born 16th February, 1922, bred by N. G. Renont, St. Martin's, Jersey; s Fly Sultan, d Queen's Daisy (24361), s d Squire of Lynn (5277).

CLASS 117.—Jersey Bull, calved before 1922. [11 entries].

I. (210.)—R. B. WARD, Godinton, Ashford, Kent, broken, **Canterbury Pilgrim**, born 9th April, 1921; s Pilgrim (13699), d Capar, s d Capsicum (10892).

II. (25.)—COLONEL L. GISBORNE, C.M.G., Lingen Hall, Brampton Bryan, whole, **Ocean Premier** (14065), born 19th January, 1921, bred by N. Du Feu, Trinity, Jersey; s Masterman of Oaklands (13020), d Ocean Daisy Cowslip (I.H.B. 25023), s d Daisylike's Majesty (12583).

III. (22.)—SIR G. S. WHITE, Bart., Hollywood Tower, near Bristol, dark fawn, **Willonyx Ruler**, born 5th September, 1921, bred by T. W. Avril, St. Owen, Jersey; s Forward, d Willonyx Beauty 2nd.

R. and V.H.C.—MRS. O. AMES, Blackdown, Upham, Southampton, fawn, **Plutarch**, born 21st March, 1921, bred by R. Bruce Ward, Godinton ton, Kent; s Pilgrim (13699), d Arkona (Vol. 31, p. 222), s d Rower (11134).

H.C.—MRS. B. CATER, Bentworth Lodge, Alton, Hants, whole, **Cupid**, born 25th March, 1921, bred by Major the Hon. H. Pearson, Cowdray, Midhurst, Sussex; s Pioneer's Noble (12416), d Roselle (Vol. 31), s d Northcliffe (12728).

CLASS 118. Jersey Bull, calved in 1922. [8 entries].

I. (210.)—R. B. WARD, Godinton, Ashford, Kent, whole, **My Pilgrim**, born 7th May; s Pilgrim (16699), d Mistress Mine, s d Masterman of Oaklands (13020).

II. (25.)—MRS. HAYES SADLER, Norsbury, Sutton Scotney, Hants, whole, **General Sultan**, born 16th May; s General Bosnian (13946), d Camilla (Vol. 34), s d Le Parcq Sultan (13331).

III. (22.)—MRS. O. AMES, Blackdown, Upham, Southampton, broken, **Sybil's Warrior Prince**, born 30th May; s Reynard (13735), d Dainty Danish (Vol. 33), s d Cuphea's Warrior.

R.—E. A. MATTOCK, Lowton House, Taunton, **Lustre's Sultan** (Folio 31), born 18th November; s Xenia Sultan (13798), d Lady Lustre (20837), s d Peppermint (4762).

CLASS 119. Jersey Bull, calved in 1923. [11 entries].

I. (210.)—G. CROSS, Smart's Hill House, Penshurst, Kent, whole, **Gloxalia's Penshurst Pilgrim**, born 18th May; s Canterbury Pilgrim, d Gloxalia 2nd, s d King Capsicum.

II. (25.)—R. B. WARD, Godinton, Ashford, Kent, broken, **Sir Laurel**, born 11th May; s Saint Louis, d Evergreen, s d Catillon's Prince (11639).

III. (22.)—MRS. O. AMES, Blackdown, Upham, Southampton, grey fawn, **Yellow Face**, born 3rd April; s Favourite Gamboge (14277), d Brown Face (Vol. 35), s d The Cid (12473).

R.—J. C. HURLE, Kilve Court, Bridgwater, whole, **Vaingold**, born 2nd February; s Sterling (E.J.H.B. 14122), d Vanity (E.J.H.B. Vol. 33, p. 449), s d Heath Lad (E.J.H.B. 13976).

GUERNSEY.

(£20 towards the Prizes in the Guernsey Classes were given by the English Guernsey Cattle Society).

CLASS 120.—*Guernsey Cow, in-Milk, calved before 1921.* [14 entries].

I. (210.)—E. CHRISTIAN, Otterbourne House, Winchester, Hants, fawn and white, **Good Luck of Standen 2nd**, born 2nd January, 1920, bred by Mrs. Cookson, Chute Standen, Andover, Hants; s Dene Morn Star, d Good Luck, s d Desire.

II. (25.)—W. DUNHELS, Fernhill Park, Windsor Forest, Berks, fawn and white, **Starlight Broom**, born 20th April, 1919, bred by Mrs. A. Martineau, Broom Hall, Sunningdale, Berks; s Hurst Freda Jewell 2nd (3543), d Brittleware Starlight (9868), s d Brittleware Robin (2415).

III. (22.)—J. B. BODY, Hindhead Court, Hindhead, Surrey, fawn and white, **Polly of the Isle of Goodnestone 3rd** (14671), born 25th February, 1919, bred by H. F. Plumptre, Goodnestone Park, Canterbury; s Rose Lad of Goodnestone (3163), d Polly of the Isles 10th (8206), s d Golden Noble (1930).

R.—A. C. BEATTY, Calehill Park, Little Chart, Kent, fawn and white, **Lily of L'Aumone 2nd** (14555), born 25th October, 1917, bred by E. T. Wheadon, St. Peter Port, Guernsey; s May Boy of Mont Plaisant (3862 P.S.), d Lily of L'Aumone (14527 P.S.), s d Honoria's Sequel 2nd (2816 P.S.).

H.C.—Ditto, ditto, fawn and white, **Floss of Bella Cottage** (13522), born 18th September, 1917, bred by A. Gaudion, Bella Cottage, Vale, Guernsey; s Mota's Pride Les Moulin (3750 P.S.), d Popular Shop Girl (14253 P.S.).

CLASS 121.—*Guernsey Heifer, in-Milk, calved in 1921.* [7 entries.]

I. (210.)—J. B. BODY, Hindhead Court, Hindhead, Surrey, fawn and white, **Morland Lady Richmond** (16788), born 15th February, bred by G. F. Ferrand, Clanville Lodge, Andover; s Slogan's Climax (4035), d Richmond's Zoe of 1 Ruette (13845), s d Ivy's Emblem (3804).

II. (25.)—MAJOR F. J. B. WINGFIELD DIGBY, D.S.O., Sherborne Castle, Sherborne, Dorset, fawn and white, **Sherborne Castle Narcissa**, born 11th November, bred by Exhibitor; s Slogan's Climax (4035), d Morland Hyacinth (13768).

III. (22.)—A. C. BEATTY, Calehill Park, Little Chart, fawn and white, **Calehill Jeanette** (16229), born 7th April; s Murrell Golden Lad (3764), d Calehill Jean (13319), sd Dene Lode Star (3303).

CLASS 122.—*Guernsey Heifer, calved in 1922.* [9 entries].

I. (210.)—W. DUNHELS, Fernhill Park, Windsor Forest, Berks, fawn and white, **Dairymaid of Goodnestone 2nd**, born 2nd April, bred by H. F. Plumptre, Goodnestone Park, Canterbury, Kent; s Rose Lad of Goodnestone 3rd (4303), d Dairymaid of Alderney 3rd (11227), s d Golden Noble 6th (2753).

II. (25.)—J. B. BODY, Hindhead Court, Hindhead, Surrey, fawn and white, **Hindhead Princess Rosy** (17880), born 4th May, s Lynchmore Lord Roberts 15th (3982), d Lynchmore Rosy (13731), s d Sequel's Delight 2nd (3403).

III. (22.)—A. C. BEATTY, Calehill Park, Little Chart, Kent, fawn and white, **Calehill Holly Branch** (17429), born 27th October; s Murrell Golden Cheer (3993), d Dene Holly (11980), s d Dene Dandy (2720).

R.—Ditto, ditto, fawn and white, **Polly 4th of Esperanza** (22987), born 10th June, bred by Mrs. P. Langlois, Les Caches, Forest, Guernsey; s Richmond's Fancy (4393 P.S.), d Polly of Esperanza (5298 F.S.).

CLASS 123.—*Guernsey Heifer, calved in 1923.* [12 entries].

I. (210.)—W. DUNHELS, Fernhill Park, Windsor Forest, Berks, fawn and white, **Fernhill Primrose**, born 20th May; s Governor 6th of Des Ruettes (4613), d Primrose 3rd of the Naies (21709).

II. (25.)—LORD POLTIMORE, Court Hall, North Molton, North Devon, fawn and white, **Poltimore Myrtle** (19240), born 7th June; s Royal of Beaulieu (4922), d Poltimore Mona (16870), s d Pearl's Majestic (3999).

III. (22.)—J. B. BODY, Hindhead Court, Hindhead, Surrey, fawn and white, **Hindhead Rosy 2nd** (18722), born 23rd May; s Lynchmere Lord Roberts 15th (3982), d Lynchmere Rose (13731), s d Sequel's Delight 2nd (3403).

R.—LORD POLTIMORE, fawn and white, **Poltimore Butter Girl** (19237), born 18th May; s Pearl's Majestic (3990), d Beauty of Thornhill (16094), s d Sequel's Slogan (3895 P.S.).

V.H.C.—J. B. BODY, fawn and white, **Hindhead Polly 3rd** (18719), born 25th April; s Governor 4th des Ruettes (3718), d Polly of the Isles of Goodnestone 3rd (14671), s d Rose Lad of Goodnestone (3161).

H.C.—MAJOR F. B. DALRYMPLE, Bartley Lodge, Cadnam, Kent, fawn and white, **Bartley Tidy 4th**, born 14th August; s Georgie de Villocq, d Bartley Tidy 3rd, s d Bartley Governor.

G.—A. C. BEATTY, Calehill Park, Little Chart, Kent, fawn and white, **Calehill Peaceful** (18659), born 14th February; s Clara's Slogan, d Peace Poundstock (18145), s d Lenore's Sequel of Vimiera (4247).

CLASS 124. *Guernsey Bull, calved in 1920 or 1921.* [6 entries].

I. (210.)—MAJOR F. B. DALRYMPLE, Bartley Lodge, Cadnam, Hants, fawn and white, **Georgie de Villocq**, born 10th July, 1921, bred by J. Martel, Villocq, Castel, Guernsey; s Governor of Myrtle Place 5th, d La Blanchette du Villocq, s d Gay Boy 6th of Myrtle Place.

II. (25.)—LORD POLTIMORE, Court Hall, North Molton, North Devon, fawn and white, **Royal of Beaulieu** (4922), born 18th May, 1921, bred by J. J. Gavet, Beaulieu, St. Andrew's, Guernsey; s May Boy of Beaulieu (4300 P.S.), d Margaret 2nd of Beaulieu (14292 P.S., A.R. 383), s d Flora's Sequel of Vimiera (2921 P.S.).

CLASS 125.—*Guernsey Bull, calved in 1922.* [8 entries].

I. (210.)—J. B. BODY, Hindhead Court, Hindhead, Surrey, fawn and white, **Hindhead Governor** (4842), born 24th October; s Governor 4th des Ruettes (3718), d Rosy of Goodnestone (12343), s d Gunner 3rd (2459).

II. (25.)—E. CHRISTIAN, Otterbourne House, near Winchester, Hants, fawn and white, **Elfordleigh Sunday**, born 15th October, bred by Mrs. R. C. Bainbridge, Elfordleigh, Plympton, Devon; s Elfordleigh Hammill, d Durrington Beauty, s d Rose King.

III. (22.)—MRS. V. T. HILL, Woodspring Priory, Weston-super-Mare, fawn and white, **President 3rd of Vimiera**, born 20th May, bred by F. Belloir, Vimiera, Guernsey; s Governor of Myrtle Place 5th (4337 P.S.), d Flora 3rd of Vimiera (12694 P.S., 229 A.Q.), s d Deanie's Squire (2734 P.S.).

R.—MRS. H. PONSONBY, Little Dormans, Lingfield, fawn and white, **Dormans Charmant** (E.G.C.S. 4767), born 25th August; s Treabyn Mill (E.G.C.S. 4064), d Leman Golden Lily (E.G.C.S. 15549), s d Young Lynchmere (3625), Kenilworth Lily (12876).

CLASS 126.—*Guernsey Bull, calved in 1923.* [7 entries].

I. (210.)—J. B. BODY, Hindhead Court, Hindhead, Surrey, fawn and white, **Hindhead Governor 2nd** (5038), born 28th May; s Governor 4th des Ruettes (3718), d Lynchmere Rosy 2nd (14575), s d Robert's Boys' Sequel (2496).

II. (25.)—W. DUNHELS, Fernhill Park, Windsor Forest, Berks, fawn and white, **Fernhill Desmond**, born 18th June; s Murrell Desmond (4263), d Donnington Irene 6th (14258).

III. (22.)—COMMANDER H. E. GORE-LANGTON, Hatch Park, Taunton, dark fawn and white, **Beauchamp North Star**, born 19th February; s Elfordleigh Champion (4184), d Beauchamp Bramble 6th (15030).

R.—E. CHRISTIAN, Otterbourne House, near Winchester, Hants, fawn and white, **Elfordleigh Otterbourne**, born 25th May; s Elfordleigh Jewel, d Haughty Merrie Maid, s d May Rose's Billy 2nd.

KERRY.

(£15 towards the Prizes in the Kerry Classes were given by the English Kerry and Dexter Cattle Society).

CLASS 127.—*Kerry Cow or Heifer, in-Milk, calved in or before 1921.*
[8 entries].

I. (£10).—CAPT. N. ZAMBRA, M.C., and C. WILLIAMSON-MILNE, West Tisted Manor, Ropley, Hants, **Castle Lough Cowslip 4th** (2238), born 3rd March, 1917, bred by J. Hilliard, Killarney; s Castle Lough Dermott (377), d Castle Lough Cowslip 3rd (2023), s d Castle Lough Rover (746).

II. (£5).—MRS. FREELAND, Cheselbourne Manor, near Dorchester, **Kilmorna Primrose 17th** (4092), born 27th April, 1915, bred by D. J. Janasz, Kilmorna, Listowel, Co. Kerry; s Kilmorna Lord 13th (750), d Kilmorna Primrose 2nd (3356), s d Gort Sheen (475).

CLASS 128.—*Kerry Heifer, calved in 1922 or 1923.* [7 entries].

I. (£10).—LADY FITZGERALD, Buckland House, Faringdon, Berks, **Buckland Emma**, born 24th May, 1923; s Buckland Ashby (499), d Buckland Peace 2nd, s d Valencia Royal Chief (462).

II. (£5).—CAPT. N. ZAMBRA, M.C., and C. WILLIAMSON-MILNE, West Tisted Manor, Ropley, Hants, **Hattingley Bridget**, born 19th July, 1923; s Valencia Samson (535), d Gort Drops 6th (2256), s d Gort Peter (597).

III. (£2).—MRS. FREELAND, Cheselbourne Manor, near Dorchester, **Cheselbourne Primrose**, born 1st February, 1923; s Dur Dudley (924), d Kilmorna Primrose 17th (4092), s d Kilmorna Lord 13th (750).

R.—CAPT. N. ZAMBRA, M.C., and C. WILLIAMSON-MILNE, **Hattingley Bramble**, born 3rd March, 1923; s College Pat (504), d Hattingley Hadji (2608).

CLASS 129.—*Kerry Bull, calved in 1921, 1922 or 1923.* [7 entries].

I. (£10).—LADY FITZGERALD, Buckland House, Faringdon, Berks, **Buckland Thor**, born 15th June, 1922; s Buckland Viking (470), d Walton Jonquil 4th (1521), s d Walton Clumber (234).

II. (£5).—MRS. FREELAND, Cheselbourne Manor, near Dorchester, **Cheselbourne Duke** (1115), born 28th March, 1922; s Dur Dudley (924), d Kilmorna Primrose 23rd (4093), s d Kilmorna Lord 13th (750).

III. (£2).—CAPT. N. ZAMBRA, M.C., and C. WILLIAMSON-MILNE, West Tisted Manor, Ropley, Hants, **Valencia Samson** (535), born 22nd April, 1921, bred by Knight of Kerry, Valencia Island; s Czar of Carton (920), d Valencia Fina (4285), s d Valencia Chief (852).

R.—MRS. FREELAND, **Dur Demon** (1186), born 4th April, 1921, bred by John O'Neill, Chilton Cross Houses, Shropshire; s Valencia Safe-guard (907), d Dur Divine 2nd (3491), s d Gort Sheen 7th (659).

DEXTER

CLASS 130.—*Dexter Cow or Heifer, in-Milk, calved in or before 1921.*
[8 entries].

I. (210.)—W. D. HALL, M.C., Gwernyfed Park, Three Cocks, Brecon, red, **Byford Lass**, born 8th May, 1921, bred by J. H. Wotton, Byford, Bridge Sollers, Hereford; s Byford Banner, d Byford Primrose (F.S.).

II. (25.)—MRS. C. M. L. CALVERT, Banwell Castle, Banwell, Somerset, red, **Ladybird**, born 4th March, 1920, bred by Rev. W. W. Joyce, Charles Rectory, Devon; s Charlemagne (604), d Tortoiseshell (2442 F.S.).

III. (22.)—REV. W. W. JOYCE, Charles Rectory, Barnstaple, black, **Charlotte of Exmoor**, born 3rd December, 1917; s Black Jack (579), d Marion 3rd, s d Autumn Prince (556).

CLASS 131.—*Dexter Heifer, calved in 1922 or 1923.* [6 entries].

I. (210.)—REV. W. W. JOYCE, Charles Rectory, Barnstaple, black, **Jesamine**, born 18th May, 1922; s Luck Money (612), d Jester of Exmoor, s d Charlemagne of Exmoor (604).

II. (25.)—LIEUT.-COL. W. O. GIBBS, Home Farm, Barrow Gurney, black, **Barrow Duchess 16th**, born 17th March, 1922, bred by G. M. Gibbs, Gratwicke Hall, Flax Bourton; s Barrow Mr. Murphy, d Barrow Duchess 11th, s d Barrow Bean 3rd.

CLASS 132.—*Dexter Bull, calved in 1921, 1922 or 1923.* [8 entries].

I. (210.)—MRS. C. M. L. CALVERT, Banwell Castle, Banwell, Somerset, black, **Wightwick Paul** (Vol. 23, E.K. & D.S.), born 6th June, 1922, bred by Sir W. Evans, Bart., Wightwick Hall, Wolverhampton; s Oakridge Pat (673), d Oakridge Beryl (2055).

II. (25.)—LIEUT.-COL. W. O. GIBBS, Home Farm, Barrow Gurney, black, **Woodleigh Rex**, born 22nd January, 1923, bred by A. Scratton, Bradford-on-Avon, Wilts; s Bagendon Senator, d Cowbridge Sweet Nellie, s d Cowbridge Dainty Jock.

III. (22.)—MRS. M. H. NEVILLE, Copthorne Farm, Worth, Sussex, black, **Copthorne Krinkel**, born 30th March, 1923; s April Fool (640), d Lady Elsie (2642 F.S.).

R.—W. A. PRITCHARD, Brentwood, Brent, South Devon, black, **Brentmoor Bracken**, born 22nd March, 1922; s Don Carlos (698), d Midnight (2990), s d Hever Sonny (666).

H.C.—LIEUT.-COL. W. O. GIBBS, black, **Barrow Bristol**, born 20th October, 1923; s Byford Banner, d Bianca (F.S.2005).

C.—REV. W. W. JOYCE, Charles Rectory, Barnstaple, black, **Viscount of Exmoor**, born 21st June, 1923; s Charlemagne of Exmoor (604), d Charlotte of Exmoor, s d Black Jack (579).

(The Prizes in Class 133 were given by the English Kerry and Dexter Cattle Society).

CLASS 133.—*Dexter Bull, calved in 1923, whose sire and dam were entered in the English Kerry and Dexter or Royal Dublin Society's Herd Book.* [10 entries].

I. (£10.)—**LIEUT.-COL. W. O. GIBBS**, Home Farm, Barrow Gurney, black, **Woodleigh Rex**, born 22nd January, 1923, bred by A. Scratton, Bradford-on-Avon, Wilts; s Bagendon Senator, d Cowbridge Sweet Nellie, s d Cowbridge Dainty Jock.

II. (£3.)—**J. H. WOOTTON**, Byford, Bridge Sollars, Hereford, red, **Byford Prince**, born 24th March, 1923; s Byford Laddie, d Byford Primrose (F.S.).

III. (£2.)—**MRS. M. H. NEVILLE**, Copthorne Farm, Worth, Sussex, black, **Copthorne Krinkel**, born 30th March, 1923; s April Fool (640), d Lady Elsie (2642 F.S.).

R.—**LIEUT.-COL. W. O. GIBBS**, black, **Barrow Bristol**, born 20th October, 1923; s Byford Banner, d Bianca (F.S. 2005).

H.C.—**MRS. C. M. L. CALVERT**, Banwell Castle, Banwell, Somerset, **Banwell Brat**, born 19th June, 1923; s Fillongley Forest Fiend (Vol. 20, p. 78 E.K. & D.S.), d Pierrette 5th (2791 E.K. & D.S.), s d Pedestrian (676).

C.—Ditto, ditto, black, **Banwell Boob**, born 7th July, 1923; s Fillongley Forest Fiend (Vol. 21, p. 78 E.K. & D.S.), d Pulcinella 11th (3030), s d Bold Boy (623).

SPECIAL PRIZE.

GIVEN BY THE ENGLISH KERRY AND DEXTER CATTLE SOCIETY.

The Devonshire Challenge Cup, for the best Animal in Classes 130 to 133, bred by Exhibitor, and entered in or eligible for the English Kerry and Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.

The Certificate of Award of the English Kerry and Dexter Cattle Society will be given to the owner of the winning animal on each occasion the Cup is competed for.

I.—**REV. W. W. JOYCE**, Charles Rectory, Barnstaple, black, **Jesamine**, born 18th May, 1922; s Luck Money (612), d Jester of Exmoor, s d Charlemagne of Exmoor (604).

R.—**J. H. WOOTTON**, Byford, Bridge Sollars, Hereford, red, **Byford Prince**, born 24th March, 1923; s Byford Laddie, d Byford Primrose (F.S.).

MILK TEST.

CLASS 134.—*Cow, in Milk, of any breed or cross, under 950lbs. live weight, yielding the largest quantity of Milk, of normal character, containing at each time of milking not less than 3 per cent. fat, the period of lactation being taken into consideration. [63 entries].*

I. (£10.)—**MRS. O. AMES**, Blackdown, Upham, Southampton, light fawn Jersey, **Fairy Winks**, born 4th December, 1917, bred by J. P. le Marquard, St. Ouen's, Jersey; s Fairy General (12600), d Financial Winks (22049), s d Financial Baron (11310). (Last calf February 15th, 1924.)

II. (£5.)—Ditto, ditto, whole fawn, Jersey, **Frostie 4th**, born 26th August, 1918, bred by A. Hardy, St. Martin's, Jersey; s The Cid (19473), d Frostie 2nd (22663), s d Zanzibar Bright Prince (12197). (Last calf 28th February, 1924.)

III. (£2.)—**G. BERRY**, Mount Bures, Bures S.O., Suffolk, nearly whole Jersey, **Postage 2nd**, born 18th April, 1918; s Verdun, d Postage, s d Dinah's Bat.

R.—Ditto, ditto, whole Jersey, **Postmistress**, born 23rd January, 1922; s Lord Blackberry, d Postage 2nd, s d Verdun. (Last calf January 16th, 1924.)

H.C.—**E. A. STRAUSS**, Kingston House, Abingdon, Berks, whole Jersey, **Sultan's Remembrance 6th**, born 16th March, 1914, bred by E. Mathews, C.V.O., Little Shardeloes, Amersham, Bucks; s Noble Sultan of Oaklands (110), d Remembrance 9th, s d Carnation Crown (6493). (Last calf March 3rd, 1924.)

C.—**G. BERRY**, Mount Bures, Bures S.O., Suffolk, whole Jersey, **Golden Raspberry**, born 29th December, 1920; s Golden Bilberry, d Raspberry 2nd, s d Verdun. (Last calf February 9th, 1924).—**R. B. WARD**, Godinton, Ashford, Kent, whole Jersey, **Prometheus Queen**, born 20th November, 1919; s Prometheus (13391), d Mulcaster's Queen, s d Mulcaster (12399). (Last calf January 18th, 1924.)

CLASS 135.—*Cow, in-Milk, of any Breed or cross, 950lbs. live weight or over, yielding the largest quantity of milk of normal character, containing at each time of milking not less than 3 per cent. fat, the period of lactation being taken into consideration. [63 entries].*

I. (£10.)—**G. HOLT-THOMAS**, Northdean House, Hughenden, Bucks, British Friesian, **Colton Sunray** (32650), born 31st October, 1918, bred by H. Brown, Colton Mains, Dunfermline; s Terling (Imp.) Vic Bertus (4541), d Colton Sunset (6868), s d Colton Puritan (95). (Last calf March 22nd, 1924.)

II. (25.)—H. M. MARTINEAU, The Lodge, Holyport, Berks, British Friesian, **Cymric St. Martha**, born 24th January, 1917, bred by Lieut.-Col. G. R. Powell, Tynewydd, Hیرهain, Glam.; s Cymric (Imp.) Frits, d Cymric St. Margaret, s d Melford Jester. (Last calf December 7th, 1923).

III. (22.)—W. TURNER, Stonehouse, Much Marcle, Dymock, Gloucestershire, British Friesian, **Hawthorn Crocus** (39428), born 17th January, 1919; s Garstage (Imp.) Mietjes Victor (3739), d Spurshalb Rioulette (26548), s d Hedges Mine Layer (3995). (Last calf December 17th, 1923).

R.—D. A. MUSGRAVE, Land End Farm, Stoke St. Gregory, Taunton, red, little white, **Dairymaid 1st**, aged 8½ years. (Last calf, April 15th, 1924).

H.C.—KINGSCLERE FARMS, Kingsclere, Hants, red and little white Dairy Shorthorn, **Ashton Red Duchess**, born 12th September, 1916, bred by W. R. Withers, Lower Court Farm, Long Ashton, Bristol; s Pastures Nonpariel (121929), d Priceless Darlington, s d Ursula's Priceless Prince (107353). (Last calf 4th June, 1923).

C.—R. A. LEE, Ashford, Cannington, Bridgwater, Devon, **Ashford Lady** (C634), born 26th June, 1915, bred by the late G. Reed, Sandhill, Withycombe; s Pound Lord (7834), d Waterhouse, s d Hestercombe Chartist (6397). (Last calf 22nd February, 1924).—MAJOR J. G. DUGDALE, Whiteway Farm, Cirencester, Red Poll, **Framlingham Proud Lass**, born 21st November, 1918, bred by W. Woodgate, Eyke, Woodbridge; s Sudbourne Crossbow (10928), d Worlingworth Proud Girl (24927), s d Worlingworth Red Ensign (10692). (Last calf December 24th, 1923).—MRS. EVELYN, Wotton House, Dorking, black Jersey, **Fairlawne Hussy**, born 8th August, 1916, bred by W. M. Cazalet, Tonbridge; s Sir Toby (12154), d Hussy 13th (Imp.), s d MacDougal. (Last calf January 13th, 1924).—A. C. BEATTY, Calehill Park, Little Chart, Kent, fawn and white Guernsey, **Flossy of Bella Cottage** (13522), born 18th September, 1917, bred by A. Gaudion, Bella Cottage, Vale, Guernsey; s Mota's Pride Les Moulin (3750 P.S.), d Popular Shop Girl (14253 P.S.). (Last calf January 2nd, 1924).

SPECIAL PRIZE.

Given by the British Friesian Cattle Society to the owner of the Cow awarded the greatest number of points in Classes 134 and 135, provided that such Cow is a British Friesian.

I. (250.)—G. HOLT-THOMAS, Northdean House, Hughenden, Bucks, **Colton Sunray** (32650), born 31st October, 1918, bred by H. Brown, Colton Mains, Duniermline; s Terling (Imp.) Vic Bertus (4541), d Colton Sunset (6868), s d Colton Puritan (95).

BUTTER TEST.

CLASS 136.—Cow, of any breed or cross, under 950lbs. live weight, obtaining the greatest number of points by the practical test of the separator and churn. [61 entries].

I. (25.)—G. BERRY, Mount Bures, Bures S.O., Suffolk, whole Jersey, **Golden Raspberry**, born 29th December, 1920; s Golden Bilberry, d Raspberry 2nd, s d Verdun.

II. (23).—E. A. STRAUSS, Kingston House, Abingdon, Berks, whole Jersey, **Sultan's Remembrance 6th**, born 16th March, 1914, bred by E. Mathews, C.V.O., Little Shardeloes, Amersham, Bucks; s Noble Sultan of Oaklands (110), d Remembrance 9th, s d Carnation Crown (6493).

III. (22).—MRS. EVELYN, Wotton House, Dorking, Jersey, **Wotton Relustria**, born 11th July, 1917; s Illustrious, d Record 3rd (Vol. 21, p. 406), s d Astor (3042).

R.—G. BERRY, whole Jersey, **Postmistress**, born 23rd January, 1932; s Lord Blackberry, d Postage 2nd, s d Verdun.

C.—R. B. WARD, Godinton, Ashford, Kent, whole Jersey, **Prometheus Queen**, born 20th November, 1919; s Prometheus (13391), d Mulcaster's Queen, s d Mulcaster (12399).—MRS. O. AMES, Blackdown, Upham, Southampton, light fawn Jersey, **Fairy Winks**, born 4th December, 1917, bred by J. P. le Marquard, St. Ouen's Jersey; s Fairy General (12609), d Financial Winks (22049), s d Financial Baron (11310).—G. CROSS, Smart's Hill House, Penshurst, Kent, whole Jersey, **Eastern Queen Laxton**, born 15th February, 1917, bred by J. A. Gebaut, Trinity, Jersey; s Dame's Gamboge, d Western Queen Laxton, s d Western King.—G. BERRY, nearly whole, Jersey, **Postage 2nd**, born 18th April, 1918; s Verdun, d Postage, s d Dinah's Bat.

CLASS 137.—*Cow, of any breed or cross, 950lbs. live weight and over, obtaining the greatest number of points by the practical test of the separator and churn.* [61 entries].

I. (25).—D. A. MUSGRAVE, Lane End Farm, Stoke St. Gregory, Taunton, red, little white, **Dairymaid 1st**, aged 8½ years. (Last calf April 15th, 1924).

II. (23).—MAJOR J. G. DUGDALE, Whiteway Farm, Cirencester, Red Poll, **Framlingham Proud Lass**, born 21st November, 1918, bred by W. Woodgate, Eyke, Woodbridge; s Sudbourne Crossbow (10928), d Worlingworth Proud Girl (24927), s d Worlingworth Red Ensign (10692).

III. (22).—MRS. EVELYN, Wotton House, Dorking, black, Jersey, **Fairlawne Hussy**, born 8th August, 1916, bred by W. M. Cazalet, Tonbridge; s Sir Toby (12154), d Hussy 13th (Imp.), s d MacDougal.

R.—W. DUNHELS, Fernhill Park, Windsor Forest, Berks, fawn and white, **Starlight Broom**, born 20th April, 1919, bred by Mrs. A. Martineau, Broom Hall, Sunningdale, Berks.; s Hurst Freda Jewel 2nd (3543), d Brittleware Starlight (9868), s d Brittleware Robin (2415).

SPECIAL PRIZES.

GIVEN BY THE RESPECTIVE BREED SOCIETIES.

For the Devon Cow obtaining the best results.

Equal I. (22 10s.).—R. A. LEE, Ashford, Cannington, Bridgwater, **Ashford Lady** (C634), born 26th June, 1915, bred by the late G. Reed, Sandhill, Withycombe; s Pound Lord (7834), d Waterhouse, s d Hestercombe Chartist (6397). (Last calf 22nd February, 1924).

Equal I. (22 10s.).—N. D. LUPTON, Chalmington, Dorchester, Dorset, **Daisy**, born 4th July, 1918, bred by H. H. Percy, Charlton, Rousdon, Lyme Regis; s Stockleigh Rentmaker 2nd (9854). (Last calf 22nd January, 1924).

For the South Devon Cow obtaining the best results.

I. (25 5s.).—W. HUNT, Tracey's Farm, Berry Pomeroy, Totnes, **Milkmaid 9th**, born 2nd September, 1916, bred by W. S. Harris, Aish Farm, Stoke Gabriel; s Well Champion (5210), d Milkmaid 4th (11644).

For the British Friesian Cow obtaining the best results.

I. (25.).—G. HOLT-THOMAS, Northdean House, Hughenden, Bucks, **Colton Sunray** (32560), born 31st October, 1918, bred by H. Brown, Colton Mains, Dunfermline; s Terling (Imp.) Vic Bertus (4541), d Colton Sunset (6868), s d Colton Puritan (95).

For the Red Poll Cow obtaining the best results.

I. (25.).—MAJOR J. G. DUGDALE, Whiteway Farm, Cirencester, **Framlingham Proud Lass**, born 21st November, 1918, bred by W. Woodgate, Eyke, Woodbridge; s Sudbourne Crossbow (10928), d Worlingworth Proud Girl (24927), s d Worlingworth Red Ensign (10692).

For the three Jersey Cows obtaining the best results.

I. (Gold Medal)—G. BERRY, Mount Bures, Bures S.O., Suffolk, whole, **Golden Raspberry**, born 29th December, 1920; s Golden Bilberry, d Raspberry 2nd, s d Verdun.

II. (Silver Medal)—MRS. EVELYN, Wotton House, Dorking, black, **Fairlawne Hussy**, born 8th August, 1916, bred by W. M. Cazalet, Tonbridge; s Sir Toby (12154), d Hussy 13th (Imp.), s d MacDougal.

III. (Bronze Medal)—E. A. STRAUSS, Kingston House, Abingdon, Berks, whole, **Sultan's Remembrance 6th**, born 16th March, 1914, bred by E. Mathews, C.V.O., Little Shardeloes, Amersham, Bucks; s Noble Sultan of Oaklands (110), d Remembrance 9th, s d Carnation Crown (6493).

For the Guernsey Cow obtaining the best results.

I. (25.).—W. DUNHELS, Fernhill Park, Windsor Forest, Berks, fawn and white, **Starlight Broom**, born 20th April, 1919, bred by Mrs. A. Martineau, Broom Hall, Sunningdale, Berks; s Hurst Freda Jewel 2nd (3543), d Brittleware Starlight (9868), s d Brittleware Robin (2415).

A further Special Prize of £10 was offered by the British Friesian Cattle Society to the owner of the British Friesian Cow obtaining more points in the tests than any other animal of any Breed.—£10.

[NOT AWARDED].

lviii Prizes awarded to Devon Longwoolled & South Devon Sheep.

SHEEP.

DEVON LONGWOOLLED.

(£10 towards the Prizes in these Classes were given by the Devon Longwoolled Sheep Breeders' Society).

CLASS 138.—Devon Longwoolled Shearling Ram. [10 entries].

I. (£10.)—F. WHITE, Torweston, Williton.

II. (£5.)—T. J. PEARCEY, Peadhill, Tiverton.

III. (£2.)—F. WHITE.

R.—T. J. PEARCEY.

V.H.C.—F. WHITE.

H.C.—E. & R. LAWRENCE, Rull, Cullompton, Devon.—J. H. TRICK, Fordton Barton, Crediton.

C.—E. & R. LAWRENCE.—J. G. PEDLER, Sampford Peverell, Tiverton, Devon.

CLASS 139.—Pair of Devon Longwoolled Ram Lambs, dropped in 1924. [5 entries].

I. (£10.)—F. WHITE, Torweston, Williton.

II. (£5.)—Ditto.

III. (£2.)—E. & R. LAWRENCE, Rull, Cullompton, Devon.

R.—T. J. PEARCEY, Peadhill, Tiverton.

C.—Ditto.

CLASS 140.—Pen of three Devon Longwoolled Shearling Ewes. [5 entries].

I. (£10.)—F. WHITE, Torweston, Williton.

II. (£5.)—Ditto.

III. (£2.)—J. G. PEDLER, Sampford Peverell, Tiverton, Devon.

R.—J. H. TRICK, Fordton Barton, Crediton.

H.C.—T. J. PEARCEY, Peadhill, Tiverton, Devon.

SOUTH DEVON.

CLASS 141.—South Devon Shearling Ram. [2 entries].

I. (£10.)—W. HUNT, Tracey's Farm, Berry Pomeroy, Totnes.

CLASS 142.—Pair of South Devon Ram Lambs, dropped in 1924—
First prize, £10—second, £5—third, £2. [1 entry, Absent].

CLASS 143. Pen of three South Devon Shearling Ewes. [1 entry].

I. (£10.)—W. HUNT, Tracey's Farm, Berry Pomeroy, Totnes.

Prizes awarded to Kent or Romney Marsh, & Southdown Sheep. lix

KENT OR ROMNEY MARSH.

(£17 towards the Prizes in these Classes were given by the Kent or Romney Marsh Sheep Breeders' Association).

CLASS 144.—*Kent or Romney Marsh Two Shear Ram.* [2 entries].

I. (£10.)—J. E. QUESTED, The Firs, Cheriton, Kent.

II. (£5.)—Ditto.

CLASS 145.—*Kent or Romney Marsh Shearling Ram.* [2 entries].

I. (£10.)—J. E. QUESTED, The Firs, Cheriton, Kent.

II. (£5.)—Ditto.

CLASS 146.—*Pair of Kent or Romney Marsh Ram Lambs, dropped in 1924.* [4 entries].

I. (£10.)—J. E. QUESTED, The Firs, Cheriton, Kent.

II. (£5.)—Ditto.

CLASS 147.—*Pen of three Kent or Romney Marsh Shearling Ewes.* [2 entries].

I. (£10.)—J. E. QUESTED, The Firs, Cheriton, Kent.

II. (£5.)—Ditto.

SOUTHDOWN.

(£17 towards the Prizes in these Classes were given by the Southdown Sheep Society).

CLASS 148.—*Southdown Two Shear Ram.* [5 entries].

I. (£10.)—SIR J. COLMAN, Bart., Gatton Park, Surrey.

II. (£5.)—LADY FITZGERALD, Buckland, Faringdon, Berks.

III. (£2.)—LADY LUDLOW, Luton Hoo, Luton, Beds.

R.—Ditto.

CLASS 149.—*Southdown Shearling Ram.* [6 entries].

I. (£10.)—SIR J. COLMAN, Bart., Gatton Park, Surrey.

II. (£5.)—LADY FITZGERALD, Buckland, Faringdon, Berks.

III. (£2.)—SIR J. COLMAN, Bart.

R.—LADY LUDLOW, Luton Hoo, Luton, Beds.

SPECIAL PRIZE.

Given by the Southdown Sheep Society, under Condition 65, subject to there being at least three competitors.—Silver Medal or £1 for the best Ram in Classes 148 and 149.

I.—SIR J. COLMAN, Bart., Gatton Park, Surrey.

R.—Ditto.

IX Prizes awarded to Southdown and Hampshire Down Sheep.

CLASS 150.—Pen of three Southdown Shearling Ewes. [2 entries].

I. (£10.)—SIR J. COLMAN, Bart., Gatton Park, Surrey.

II. (£5.)—LADY LUDLOW, Luton Hoo, Luton, Beds.

HAMPSHIRE DOWN.

(£15 towards the Prizes in these Classes and the Champion Prize were given by the Hampshire Down Sheep Breeders' Association).

CLASS 151.—Hampshire Down Shearling Ram. [5 entries].

I. (£10.)—HON. LADY HULSE, Breamore, Salisbury.

II. (£5.)—Ditto.

III. (£2.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks.

R.—TRUSTEES OF LORD WANDSWORTH AGRICULTURAL COLLEGE, Long Sutton, Basingstoke, Hants.

CLASS 152.—Hampshire Down Ram Lamb, dropped in 1924. [7 entries].

I. (£7.)—TRUSTEES OF LORD WANDSWORTH AGRICULTURAL COLLEGE, Long Sutton, Basingstoke, Hants.

II. (£5.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks.

III. (£3.)—HON. LADY HULSE, Breamore, Salisbury.

R.—Ditto.

H.C.—P. C. TORY, Shapwick, Blandford.

C.—J. JOYCE, Milverton, Somerset.

CLASS 153.—Pair of Hampshire Down Lambs, dropped in 1924. [6 entries].

I. (£10.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks.

II. (£5.)—TRUSTEES OF LORD WANDSWORTH AGRICULTURAL COLLEGE, Long Sutton, Basingstoke, Hants.

III. (£2.)—HON. LADY HULSE, Breamore, Salisbury.

R.—P. C. TORY, Shapwick, Blandford.

H.C.—J. JOYCE, Milverton, Somerset.

CLASS 154.—Pen of three Hampshire Down Shearling Ewes. [3 entries].

I. (£10.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks.

II. (£5.)—P. C. TORY, Shapwick, Blandford, Dorset.

CHAMPION PRIZE.

Best Hampshire Down Ram, Ram Lamb, Pair or Pen, in Classes 151 to 154.

I.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks.

R.—HON. LADY HULSE, Breamore, Salisbury.

OXFORD DOWN.

CLASS 155.—*Oxford Down Shearling Ram.* [9 entries].

I. (£10.)—H. W. STILGOE, The Grounds, Adderbury, near Banbury, Oxon.

II. (£5.)—Ditto.

III. (£2.)—W. TREVETHAN, Broadstone Hill, Chipping Norton.

R.—H. W. STILGOE.

C.—W. TREVETHAN.

CLASS 156.—*Pair of Oxford Down Ram Lambs, dropped in 1924.* [4 entries].

I. (£10.)—C.W.S. LTD., Manor Farm, Latton, Cricklade, Wilts.

II. (£5.)—H. W. STILGOE, The Grounds, Adderbury, near Banbury, Oxon.

III. (£2.)—C.W.S. LTD.

CLASS 157.—*Pen of three Oxford Down Shearling Ewes.* [2 entries].

I. (£10.)—H. W. STILGOE, The Grounds, Adderbury, near Banbury, Oxon.

II. (£5.)—W. TREVETHAN, Broadstone Hill, Chipping Norton.

(The Prizes in Class 158 were offered by the Oxford Down Sheep Breeders' Association and were withheld until the Animals awarded the Prizes were registered in the Flock Book.)

CLASS 158.—*Pen of three Oxford Down Ewe Lambs, dropped in 1924.* [3 entries].

I. (£6.)—C.W.S. LTD., Manor Farm, Latton, Cricklade, Wilts.

DORSET HORN.

(The animals entered in Classes 159, 161 and 163 must have been shorn bare the year of the Show).

CLASS 159.—*Dorset Horn Shearling Ram.* [5 entries].

I. (£10.)—F. J. MERSON & SON, Farringdon, North Petherton, Bridgwater.

II. (£5.)—Ditto.

III. (£2.)—H. C. HANCOCK, The Court, Milverton, Taunton.

CLASS 160.—*Pair of Dorset Horn Ram Lambs, dropped after November 1st, 1923.* [3 entries].

I. (£10.)—C. MORRIS, Highfield Hall, St. Albans and Bishops Lydeard, Somerset.

II. (£5.)—A. A BROUGHTON, Impens, North Petherton.

III. (£2.)—AWEBRIDGE & CO., LTD., Northgrounds Farm, Chale, Isle of Wight.

CLASS 161.—*Pen of three Dorset Horn Shearling Ewes.* [10 entries].

1. (£10.)—AWEBRIDGE & CO., LTD., Northgrounds Farm, Chale, Isle of Wight.

II. (£5.)—C. MORRIS, Highfield Hall, St. Albans, and Bishops Lydeard, Somerset.

III. (£2.)—W. ENGLAND, Quantock, West Monkton, Taunton, Somerset.

R.—Ditto.

(The Prizes in these Classes were given by the Dorset Horn Sheep Breeders' Association).

CLASS 162.—*Pen of three Dorset Horn Ewe Lambs, dropped after November 1st, 1923.* [2 entries].

I. (£10.)—AWEBRIDGE & CO., LTD., Northgrounds Farm, Chale, Isle of Wight.

II. (£5.)—C. MORRIS, Highfield Hall, St. Albans and Bishops Lydeard, Somerset.

CLASS 163.—*Pen of three Dorset Horn Shearling Ewes, the property of a member of the Dorset Horn Sheep Breeders' Association, who had not won a prize at the Royal, Bath and West or Royal Counties Shows during the last four years.* [6 entries].

I. (£10.)—W. ENGLAND, Quantock, West Monkton, Taunton, Somerset.

II. (£5.)—Ditto.

III. (£2.)—MAJOR H. B. NICHOLSON, D.S.O., Upton Manor Farm, Uploders, Bridport, Dorset.

R.—H. C. HANCOCK, The Court, Milverton, Taunton.

CLASS 164.—*Pen of three Dorset Horn Ewe Lambs, the property of a member of the Dorset Horn Sheep Breeders' Association, who had not won a prize at the Royal, Bath and West or Royal Counties Shows during the last four years.* [3 entries].

I. (£10.)—R. E. BENNETT, Cheselbourne, Dorchester.

II. (£5.)—MAJOR R. C. Coldwell, Spring Grove, Milverton, Somerset.

III. (£2.)—R. H. SMITH, Manor House, West Newton, Bridgwater.

DORSET DOWN.

(£15 towards the Prizes in these Classes and the Champion Prize were given by the Dorset Down Sheep Breeders' Association).

CLASS 165.—*Dorset Down Shearling Ram.* [7 entries].

- I. (£10).**—R. N. TORY, Anderson, Blandford, Dorset.
- II. (£5).**—MRS. LIONEL DE ROTHSCHILD, Exbury, Southampton.
- III. (£2).**—P. AND C. SEWARD, Weston, Petersfield, Hants.
- V.H.C.**—MRS. LIONEL DE ROTHSCHILD.
- H.C.**—HOOPER BROS., Newburgh, Winfrith.

CLASS 166.—*Pair of Dorset Down Ram Lambs, dropped in 1924.* [7 entries].

- I. (£10).**—HOOPER BROS., Newburgh, Winfrith.
- II. (£5).**—MRS. LIONEL DE ROTHSCHILD, Exbury, Southampton.
- III. (£2).**—P. AND C. SEWARD, Weston, Petersfield, Hants.
- V.H.C.**—Ditto.

CLASS 167.—*Pen of three Dorset Down Shearling Ewes.* [3 entries].

- I. (£10).**—MRS. LIONEL DE ROTHSCHILD, Exbury, Southampton.
- II. (£5).**—HOOPER BROS., Newburgh, Winfrith.

CHAMPION PRIZE.

Best Ram, Pair or Pen, in the Dorset Down Classes.

- I. (£5).**—MRS. LIONEL DE ROTHSCHILD, Exbury, Southampton.
- R.**—HOOPER BROS., Newburgh, Winfrith.

EXMOOR HORN.

(£21 towards the Prizes in these Classes were given by the Exmoor Horn Sheep Breeders' Society).

CLASS 168.—*Exmoor Ram, 2-Shear and upwards.* [2 entries].

- I. (£10).**—J. HARRIS, Wistland Pound, Kentisbury, Barnstaple, bred by W. Gammen, Simonsbath.
- II. (£5).**—O. T. AND A. F. ROBINS, Lydcott Hall, High Bray, Barnstaple, bred by T. W. Burnell, North Molton.

CLASS 169.—*Exmoor Horn Shearling Ram.* [2 entries].

- I. (£10).**—O. T. AND A. F. ROBINS, Lydcott Hall, High Bray, Barnstaple.
- II. (£5).**—J. HARRIS, Wistland Pound, Kentisbury, Barnstaple.

CLASS 170.—*Pair of Exmoor Horn Ram Lambs, dropped in 1924.* [3 entries].

- I. (£10).**—O. T. AND A. F. ROBINS, Lydcott Hall, High Bray, Barnstaple.
- II. (£5).**—J. HARRIS, Wistland Pound, Kentisbury, Barnstaple.
- III. (£2).**—F. BEADLE, Stowey Farm, Timberscombe.

lxiv Prizes awarded to Exmoor, Dartmoor and Suffolk Sheep.

CLASS 171.—Pen of three Exmoor Horn Shearling Ewes. [3 entries].

I. (£10.)—O. T. AND A. F. ROBINS, Lydcott Hall, High Bray, Barnstaple.

II. (£5.)—P. EVERARD, Milton's, Dulverton, Somerset.

III. (£2.)—F. BEADLE, Stowey Farm, Timberscombe.

CLASS 172.—Pair of Exmoor Horn Ewe Lambs, dropped in 1924. [2 entries].

I. (£10.)—O. T. AND A. F. ROBINS, Lydcott Hall, High Bray, Barnstaple.

II. (£5.)—J. HARRIS, Wistland Pound, Kentisbury, Barnstaple, Devon.

DARTMOOR.

(£10 towards the Prizes in these Classes were given by the Dartmoor Sheep Breeders' and Flock Book Association and the Sheep exhibited were shown in wool).

CLASS 173.—Dartmoor Ram, 2-Shear and upwards. [1 entry].

I. (£10.)—R. P. LUCE, Lower Chaddlehanger, Tavistock, Devon, bred by R. S. Luscombe, Wisdome, Cornwood, Devon.

CLASS 174.—Dartmoor Shearling Ram. [1 entry].

I. (£10.)—R. P. LUCE, Lower Chaddlehanger, Tavistock, Devon.

CLASS 175.—Pen of three Dartmoor Shearling Ewes. [1 entry].

I. (£10.)—J. WOTTON, Dunwell, Ugborough, Ivybridge.

SUFFOLK.

(£25 towards the Prizes in these Classes were given by the Suffolk Sheep Society).

CLASS 176.—Suffolk Ram, 2-Shear and upwards. [2 entries, both absent].

CLASS 177.—Suffolk Shearling Ram. [6 entries].

I. (£10.)—SIR F. H. BATHURST, Bart., D.S.O., Somborne Park, Winchester.

II. (£5.)—F. H. TURNBULL, Lower House Farm, Llantwit Major, Llantwit Censor.

CLASS 178.—Pair of Suffolk Ram Lambs, dropped in 1924. [7 entries].

I. (£10.)—C. COUSINS, Stisted, Braintree, Essex.

II. (£5.)—SIR F. H. BATHURST, Bart., D.S.O., Somborne Park, Winchester.

CLASS 179.—*Pen of three Suffolk Ewe Lambs, dropped in 1924.* [5 entries].

I. (£10.)—C. COUSINS, Stisted, Braintree, Essex.

II. (£5.)—SIR F. H. BATHURST, Bart., D.S.O., Somborne Park, Winchester.

CHAMPION PRIZE.

GIVEN BY SIR F. HERVEY BATHURST, BART., D.S.O.

A Silver Cup for the best Ram, Pair or Pen, in the Suffolk Classes.

The Cup to be won three years in succession before becoming the absolute property of the winner.

I.—C. COUSINS, Stisted, Braintree, Essex.

R.—SIR F. H. BATHURST, Bart., D.S.O., Somborne Park, Winchester.

RYELAND.

(£15 of the Prizes in these Classes were given by the Ryeland Sheep Society).

CLASS 180.—*Ryeland Ram, 2-Shear and upwards.* [2 entries].

I. (£10.)—T. L. MARTIN, Ashe Warren House, Overton, Hants.

II. (£5.)—F. H. HEALING, Oldfield, Tewkesbury, bred by T. L. Martin, Ashe Warren, near Overton, Hants.

CLASS 181.—*Ryeland Shearling Ram.* [12 entries].

I. (£10.)—E. W. LANGFORD, LTD., Wye Bridge, Hereford.

II. (£5.)—T. L. MARTIN, Ashe Warren, House, Overton, Hants.

III. (£2.)—J. R. N. WATERS, Fawke Farm, Sevenoaks, Kent.

R.—T. L. MARTIN.

V.H.C.—E. W. LANGFORD, LTD.

H.C.—J. R. N. WATERS.

C.—F. H. HEALING, Oldfield, Tewkesbury, **Oldfield Emblem.**

CLASS 182.—*Pair of Ryeland Ram Lambs, dropped in 1924.* [5 entries].

I. (£10.)—T. L. MARTIN, Ashe Warren House, Overton, Hants.

II. (£5.)—E. W. LANGFORD, LTD., Wye Bridge, Hereford.

III. (£2.)—J. R. N. WATERS, Fawke Farm, Sevenoaks, Kent.

V.H.C.—F. H. HEALING, Oldfield, Tewkesbury.

CLASS 183.—*Pen of three Ryeland Shearling Ewes.* [4 entries].

I. (£10.)—E. W. LANGFORD, LTD., Wye Bridge, Hereford.

II. (£5.)—T. L. MARTIN, Ashe Warren House, Overton, Hants.

III. (£2.)—J. R. N. WATERS, Fawke Farm, Sevenoaks, Kent.

H.C.—F. H. HEALING, Oldfield, Tewkesbury.

KERRY HILL.

(£12 towards the Prizes in Classes 184 to 186 were given by the Kerry Hill (Wales) Flock Book Society, and animals must have been shown uncoloured; the names and Flock Book Number of Rams to be given, and in Class 186 the Ewes to be bred from one Flock and the Breeder's name given.)

CLASS 184.—*Kerry Hill Ram, 2-Shear and upwards.* [3 entries].

I. (210.)—SIR D. R. LLEWELLYN, Bart., The Court, St. Fagans, near Cardiff, **Pentrenant Quaker** (7934), bred by W. V. Davies, Pentrenant.

II. (25.)—E. D. MOORE, Brampton Brian, **Pentrenant Prince** (7189), bred by W. V. Davies, Pentrenant, Churchstoke, Salop.

CLASS 185.—*Kerry Hill Shearling Ram.* [6 entries].

I. (210.)—DINAM ESTATES CO. (D. DAVIES, M.P.), Llandinam, **Gwernygog Dasher.**

II. (25.)—E. D. MOORE, Brampton Brian, **Nant Joker**, bred by D. Bowen, The Nant, Monmouth.

III. (22.)—SIR D. R. LLEWELLYN, Bart., The Court, St. Fagans, near Cardiff, **Cardiff Rambler** (Vol. 24).

R.—DINAM ESTATES CO. (D. DAVIES, M.P.), **Gwernygog Dash.**

CLASS 186.—*Pen of three Kerry Hill Shearling Ewes.* [6 entries].

I. (210.)—DINAM ESTATES CO. (D. DAVIES, M.P.), Llandinam.

II. (25.)—Ditto.

III. (22.)—E. D. MOORE, Brampton Brian.

R.—HON. MRS. SMYTH, Ashton Court, Bristol.

CHAMPION PRIZE.

GIVEN BY H.R.H. THE PRINCE OF WALES, K.G.

A Challenge Cup, value £20, for the best animal exhibited in Class 185 or 186, to be won three times in succession or four times altogether before becoming the property of the Exhibitor.

I.—DINAM ESTATES CO. (D. DAVIES, M.P.), Llandinam, **Gwernygog Dasher.**

R.—E. D. MOORE, Brampton, Brian.

GOATS.

(£14 5s. 0d. towards the Prizes in these Classes were given through the British Goat Society).

CLASS 187.—*Female Goat, in-Milk, any age, Toggenburg, British Toggenburg, British Alpine, Saanen or British Saanen.* [8 entries, only 1 present. No Award].

CLASS 188.—*Female Goat, in-Milk, any age. Any other variety.*
[7 entries].

I. (£2 10s.).—RIGHT HON. F. D. ACLAND, M.P., Killerton, Exeter, Devon, fawn, Anglo-Nubian-Swiss, **Killerton Peach** (H.B. 3736), born 30th April, 1919; s Killerton Dante (3416), d Killerton Sunstroke (1976).

II. (£1 10s.).—Ditto, ditto, light fawn, Anglo-Nubian-Swiss, **Killerton Trileum** (K.R. 6861), born 1st June, 1919; s Killerton Cambra (A.N.) 1206), d Dolly.

III. (15s.).—MRS. N. SUMMERS, Ferndown, Dorset, black and white, Anglo-Nubian-Swiss, **Atherstone Margot** (H.B. 5458), born 10th March, 1922, bred by E. A. Walmsley; s †Atherstone Pan (H.B. 4750), d Atherstone Perdita (H.B. 4242).

CLASS 189.—*Goatling. Any variety, over one year, but not exceeding two years.* [8 entries].

I. (£2 10s.).—MRS. N. SUMMERS, Ferndown, Dorset, roan, Anglo-Nubian-Swiss, **Cobalt Cyclamen** (H.B. 6047), born 11th February, 1923; s †Grange Granit (H.B. 2369), d Atherstone Mischief (H.B. 4749).

CLASS 190.—*Male Goat. Any variety, over one year, but not exceeding two years.* [2 entries].

I. (£2 10s.).—MRS. N. SUMMERS, Ferndown, Dorset, roan, Anglo-Nubian-Swiss, †**Didgemere Diarmuid** (H.B. 6320), born 19th May, 1923, bred by Mrs. Abbey, Didgemere Hall, Roydon, Essex; s †Didgemere Duncan (H.B. 5556), d Ch. Preference *Q* (H.B. 2779).

CLASS 191.—*Male Goat. Any variety, over two years.* [3 entries].

III. (15s.).—RIGHT HON. F. D. ACLAND, M.P., Killerton, Exeter, Devon, black and tan, Anglo-Nubian-Swiss, **Filliegh Pheasant** (H.B. 5205), born 4th February, 1922, bred by A. Scott Browne, Buckland Filliegh, Highampton, Devon; s †Grange Granite (H.B. 2369), d Filliegh Fancy (H.B. 3780).

CLASS 192.—*Milking Competition, for quantity and time only (three milkings).* [13 entries].

I. £2 10s.).—RIGHT HON. F. D. ACLAND, M.P., Killerton, Exeter, Devon, black and tan, Anglo-Nubian-Swiss, **Killerton Jonquil**, born 26th March, 1918, bred by Lady Acland, Killerton, Exeter, Devon; s Killerton Pink Pearl 3rd (H.B. 2838), d Killerton Turquoise 2nd (H.B. 5517). (Last kid February 21st, 1924).

SPECIAL PRIZES.

GIVEN BY THE BRITISH GOAT SOCIETY.

A Challenge Certificate for the best Female Goat, over two years, that has borne a kid.

[No Award].

A Challenge Certificate for the best Dual Purpose Goat, over two years, that has borne a kid.

[No Award].

A Challenge Certificate for the best Male Goat, over one year.

I.—MRS. N. SUMMERS, Ferndown, Dorset, roan, Anglo-Nubian-Swiss, †**Didgemere Diarmuid** (H.B. 6320), born 19th May, 1923, bred by Mrs. Abbey, Didgemere Hall, Roydon, Essex; s †**Didgemere Duncan** (H.B. 5556), Ch. Preference *Q* (H.B. 2779).

A Bronze Medal for the best Female exhibit.

I.—MRS. N. SUMMERS, Ferndown, Dorset, roan; Anglo-Nubian-Swiss, **Cobalt Cyclamen** (H.B. 6047), born 11th February, 1923, s †**Grange Granit** (H.B. 2369), d **Atherstone Mischief** (H.B. 4749).

(The Prizes awarded at this Show were also included in the awards for the British Goat Society's "Breeder's" Perpetual Challenge Cup).

PIGS.

BERKSHIRE

(£9 towards the Prizes in these Classes were given by the British Berkshire Society, and ages were calculated to May 27th, 1924).

CLASS 193.—*Berkshire Boar, exceeding 18 months old.* [4 entries, all absent].

CLASS 194. *Berkshire Boar, not exceeding 18 months old.* [4 entries].

I. (27.)—W. A. BINDLEY, Panington Court Farm, Ashchurch, Glos., **St. Simon** (B.1028), born 2nd March, 1923, bred by Capt W. Waring, Beenham House, Berkshire; s **Abinger President** (25837), d **Pamber Prolific** (22705), s d **Minley King** (18364).

II. (24.)—F. SYKES, Richings Park, Colnbrook, Bucks, **Richings Beau Brocade** (B.798), born 20th July, 1923; s **Abingu King Alpha** (285), d **Herriard Beauty 1st** (238), s d **Herriard Colonel** (22042).

CLASS 195.—*Berkshire Breeding Sow, exceeding 18 months old.* [8 entries].

I. (210.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Sefton Azizum 5th** (25691), born 2nd January, 1921, bred by the late Sir B. Oppenheimer, Sefton Park, Stoke Poges, Slough, Bucks; s **Sefton Arcturus** (23122), d **Azizum of Thornton Hall** (21052), s d **Braishfield Buck** (19909).

II. (25.)—H. C. SUTTON, Benham, Newbury, Berks, **Highclere Gay Lass**, born 5th June, 1920, bred by the Earl of Carnarvon, Highclere, Newbury; s **Highclere Warrior** (22611), d **Manor Bella** (21415), s d **Braishfield Buck** (19909).

III. (22.)—Ditto, ditto, **Sotwell Muriel**, born 6th January, 1922, bred by the late Lord Ebury, North Farm, Sotwell, Wallingford, Berks; s Herriard Premier (21853), d Iwerne Megan 3rd (21739), s d Hurry On (19635).

CLASS 196.—*Berkshire Breeding Sow, not exceeding 18 months old.*
[9 entries].

I. (27.)—F. SYKES, Richings Park, Colnbrook, Bucks, **Richings Beauty 1st** (S.3073), born 3rd January, 1923; s Heale Nutmeg 2nd (26448), d Herriard Beauty 1st (238), s d Herriard Colonel (22042).

II. (24.)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Basildon Azizum**, born 1st January, 1923; s Jamaica Frederick (23658), d Sefton Azizum 5th (20691), s d Sefton Arcturus (23122).

III. (22.)—F. SYKES, **Richings Haytime** (3074), born 7th January, 1924; s Jamaica Liquid (16010), d Whitley Haybag (5412), s d Lucky John (20371).

R.—H. C. SUTTON, Benham, Newbury, Berks, **Manor Sweet Elizabeth**, born 5th January, 1923, bred by A. Hiscock, France Farm, Blandford, Dorset; s Iwerne First Grade, d Manor Pearl 2nd, s d Manor Acme.

CHALLENGE CUPS (Value £10 10s. each).

GIVEN BY THE BRITISH BERKSHIRE PIG SOCIETY.

To be won twice in succession or three times in all before becoming the property of the Exhibitor.

A Silver Medal was awarded to the Breeder of the prize-winning animals.

Best Boar in Classes 193 or 194.

I.—W. A. BINDLEY, Panington Court Farm, Aschurch, Glos., **St. Simon** (B.1028), born 2nd March, 1923, bred by Capt. W. Waring, Beenham House, Berkshire; s Abinger President (25837), d Pamber Prolific (22705), s d Minley King (18364).

R.—F. SYKES, Richings Park, Colnbrook, Bucks, **Richings Beau Brocade** (B.798), born 20th July, 1923; s Abingu King Alpha (285), d Herriard Beauty 1st (238), s d Herriard Colonel (22042).

Best Sow in Classes 195 or 196.

I.—F. SYKES, Richings Park, Colnbrook, Bucks, **Richings Beauty 1st** (S.3073), born 3rd January, 1923; s Heale Nutmeg 2nd (26448), d Herriard Beauty 1st (238), s d Herriard Colonel (22042).

R.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, Berks, **Sefton Azizum 5th** (25691), born 2nd January, 1921, bred by the late Sir B. Oppenheimer, Sefton Park, Stoke Poges, Slough, Buck.; s Sefton Arcturus (23122), d Azizum of Thornton Hall (21052), s d Braishfield Buck (19909).

LARGE BLACK.

(£40 towards the Prizes in these Classes and the Champion Prizes were given by the Large Black Pig Society).

CLASS 197.—Large Black Boar, farrowed before May 1st, 1923.
[17 entries].

I. (£10).—B. M. EDE, Plurrenden, Woodchurch, Kent, **Awton Samson** (21891), born 7th March, 1921, bred by G. H. Beaton; s Cornwood Confessor (12967), d Drayton Daphne (335556), s d Loughtor Marvel (4437).

II. (£5).—W. J. WARREN, Deacon's Farm, Staplegrove, Taunton, **Kibbear Royalist 2nd** (29195), born 2nd January, 1923; s Vahan Jack 5th (13845), d Trull Dusky Queen (58240), s d Bassingbourne Squire (9053).

III. (£2).—C. C. PYKE, O.B.E., Capel Layse, Holmwood, Surrey, **Holmwood Laddie** (25099), born 4th June, 1922; s Drayton Convivial 3rd (16457), d Trevelos Lass 22a (44736), s d Vahan Melva 2nd (5691).

R.—W. L. HUBBLE, New House Farm, Headcorn, Kent, **Runtley Marvel 3rd** (24737), born 27th October, 1922, bred by — Nuthall, Sutton Green, Guildford; s Cornwood Marvel 2nd (15831), d Vahan Maisie (31624), s d Cornwood Vahan Wonder (7185).

H.C.—W. J. WARREN, **Kibbear Royal Willie** (25777), born 9th September, 1922; s Vahan Jack 5th (13845), d Kibbear Lady Hilda 1st (58232), s d Bassingbourne Squire (9053).—H. J. WATSON, Hermongers, Rudgwick, Sussex, **Valley All Right** (27261), born 24th August, 1922, bred by J. C. Oliver, Woodland Valley, Ladock, Cornwall; s Valley Sportsman (23735), d Tregothnan Jenny Malpus (15824), s d Menna Dandy (7953).

C.—W. M. WILLS, Estate Office, Bracken Hill, Leigh Woods, near Bristol, **Brackenhill Naik 1st** (29057), born 18th January, 1923; s Fentongollan Naik (9455), d Treator Good (75676), s d Bodrigan Prince (13389).—MAJOR H. S. L. WOLLEY, St. Catherine's End Farm, Bath, **Tinten Sam** (22929), born 13th October, 1921, bred by H. E. Bastard, St. Tudy, Bodmin, Cornwall; s Westpetherwin Chief 1st (14433), d Tinten Black Bess 34th (38340).

CLASS 198.—Large Black Boar, not exceeding 12 months old on May 1st, 1924. [16 entries].

I. (£10).—J. H. GLOVER, J.P., Cornwood, South Devon, **Whitshall Goodboy 2nd** (28033), born 2nd May, 1923, bred by W. Yeoman, Whitehall, Malborough, South Devon; s Awton Samson (21891), d Cornwood Lass 56th (25732); s d Cornwood Confessor (12967).

II. (£5).—T. BURROWS, Brook Farm, Uffculme, Devon, **Brook Colonel** (28341), born 2nd May, 1923; s Awton Major (20713), d Brook Lass 32nd (40442), s d Treveglos Brook King (7979).

III. (£2).—A. P. COCKBURN, Stanborough, Halwell, South Devon, **Stanborough Simple**, born 28th August, 1923; s Awton Samson (21892), d Barton Pine Meg, s d Trevisquite Centre Forward (11451).

R.—D. DOWLAND & SON, Moorcoft Farm, Lidsing, by Chatham, Kent, **Lidsing Achilles**, born 9th July, 1923; s Maxwelltown Prince Charlie (15679), d Tinten Princess 2nd (68492), s d Fentongollan Lad (10567).

H.C.—R. C. BERRY, Lower Stoford, Bradford, Taunton, **Stoford Black Boy** (30363), born 3rd May, 1923; s Burton Black Prince 3rd (25597), d Vahan Avita 4th (31654), s d Cornwood Vahan Wonder (7185).—S. NUTHALL, Runtley Farm, Sutton Green, near Guildford, **Runtley Trumpeter**, born 2nd July, 1923; s Runtley Colonel (20729), d Waterdeen Miss Melody (74846), s d Bywell Arab (12259).

C.—B. M. EDE, Plurrenden, Woodchurch, Ashford, **Plurrenden Surprise 8th**, born 3rd June, 1923; s Wix Blacky (21443), d Sudbourne Sweep 1st (22064), s d Sudbourne Mate (6809).—H. M. MARTINEAU, The Lodge, Holport, Berks, **Maxwelltown Laddie 27th**, born 5th July, 1923, bred by A. Dyson Laurie, Homefield, Sevenoaks; s Maxwelltown Prince Charlie, d Waxwelltown Lassie 31st (73486), s d Tinten King John (12489).

CLASS 199.—*Large Black Boar, farrowed in 1924.* [18 entries].

I. (27).—A. P. COCKBURN, Stanborough, Halwell, S. Devon, **Stanborough Sonny**, born 4th January; s Brent Boy, d Awton Susan, s d Cornwood King John.

II. (24).—C. C. PYKE, O.B.E., Capel Leyse, Holmwood, Surrey, **Holmwood Royal Highness** (A.57), born 5th January; s Runtley King Victor (23705), d Holmwood Czarina 7th (52938), s d Vahan Level Wonder (9061).

III. (22).—J. H. GLOVER, J.P., Cornwood, South Devon, **Cornwood Everyday**, born 5th January; s Awton Sunstar (25063), d Cornwood Progress (53076), s d Cornwood Confessor (12967).

R.—MAJOR J. G. DUGDALE, Whiteway Farm, Cirencester, **Whiteway Duke 3rd**, born 1st January; s Cornwood Doonard (20621), d Whiteway Duchess 2nd (78860), s d Tinten Whiteway Venture (16877).

H.C.—W. J. WARREN, Deacon's Farm, Staplegrove, Taunton, **Kibbear Royalist 3rd**, born 3rd March; s Farthing's Prince, d Trull Dusky Queen (58240), s d Bassingbourne Squire (9053).

C.—H. J. WATSON, Hermongers, Rudgwick, Sussex, **Hermongers Laddie 6th** (A.23), born 4th January; s Valley All Right (27261), d Treveglos Lass 23rd (44738), s d Vahan Melva 2nd (5691).—D. M. WILLS, Barley Wood, Wrington R.S.O., Somerset, **Barleywood Squire**, born 17th January; s Wisdom Pleasure, d Whiteway Pearl 2nd, s d Eaglesfield Crusader.

CHAMPION PRIZE.

Best Animal in Classes 197 to 199.

I.—J. H. GLOVER, J.P., Cornwood, South Devon, **Whitehall Goodboy 2nd** (28033), born 2nd May, 1923, bred by W. Yeoman, Whitehall, Malborough, South Devon; s Awton Samson (21891), d Cornwood Lass 56th (25732), s d Cornwood Confessor (12967).

R.—A. P. COCKBURN, Stanborough, Halwell, S. Devon, **Stanborough Sonny**, born 4th January; s Brent Boy, d Awton Susan, s d Cornwood King John.

CLASS 200.—*Large Black Breeding Sow, farrowed before May 1, 1923.*
[29 entries].

I. (\$10.)—J. H. GLOVER, J.P., Cornwood, South Devon, **Cornwood Progress** (53076), born 23rd June, 1920; s Cornwood Confessor (12967), d Cornwood Lass 56th (25732), s d Alfold Victor 2nd (6841).

II. (\$5.)—W. J. WARREN, Deacon's Farm, Staplegrove, Taunton, **Haselbury Dinah** (114150), born 13th August, 1922, bred by Major W. Harrison, Haselbury, near Crewkerne, Somerset; s Kibbear Royal Prior 3rd (21363), d Tinten Belle (48126), s d Trevisquite Padstonian (7973).

III. (\$2.)—D. DOWLAND & SON, Moorcroft Farm, Lidsing, by Chatham Kent, **Restronguet Lady** (64986), born 8th August, 1920, bred by M. H. Holman, Restronguet, Penwyn, Cornwall; s Whiteford Peacemaker (8645), d Restronguet Lonely (19840), s d Valley None Such (5401).

R.—E. W. EDWARDS, Pednor House, Chesham, Bucks, **Pednor Lady Aster 3rd** (82462), born 4th January, 1922; s Ashwell Anchorite 3rd (14417), d Bennett's End Lady Aster (30442), s d Harefield Wonder (8595).

V.H.C.—H. M. MARTINEAU, The Lodge, Holyport, Berks, **Maxwelltown Lassie 42nd** (78134), born 12th January, 1922, bred by A. D. Laurie, Homefield, Sevenoak; s Tinten King John (12489), d Maxwelltown Lassie 16th (44466), s d Vahan Troublesome (10191).

H.C.—COL. B. C. JAMES, Stevenstone, Torrington, North Devon, **Windrush Countess 4th** (104736), born 9th January, 1923, bred by H. S. Rowe, Windrush Manor, Burford, Oxon.; s Staunton Tom (19957), d Windrush Duchess 2nd (49874), s d Greystone Senior (8397). —F. J. MERSON & SON, Farrington, North Petherton, Bridgwater, **Farthing's Dixie** (114746), born 27th February, 1923, bred by Lieut.-Col. A. St. J. Blunt, Farthing's Farm, Milverton; s Haselbury Nit (22325), d Trevisquite Levelsides 33rd (55536), s d Whiteford Ranger (11521). —D. M. WILLS, Barley Wood, Wrington, R.S.O., Somerset, **Barleywood Content 4th**, born 3rd March, 1923; s Brinsea Chief, d Trevisquite Content 52nd, s d Hendra Trevisquite.

G.—F. W. A. DANIELS, Higher Ford, Wellington, Somerset, **Wellington Primrose 2nd**, born 28th January, 1923; s Wellington Watchman (18836), d Wellington Primrose (96598), s d Brook General (15993). —B. M. EDE, Plurrenden, Woodchurch, Kent, **Plurrenden Ladie 18th** (99382), born 7th January, 1923; s Wix Blacky (21443), d Burwell Ladie 4th (3321), s d Sudbourne Topper (7469). —MAJOR W. HARRISON, Haselbury, near Crewkerne, Somerset, **Haselbury Beauty**, born 3rd February, 1922; s Brent Councillor (17953), d Tinten Belle (48126), s d Trevisquite Padstonian (7973). —COL. B. C. JAMES, Stevenstone, Torrington, North Devon, **Windrush Mary** (109844), born 25th August, 1922, bred by H. S. Rowe, Windrush Manor, Burford, Oxon; s Valley Woodman (19863), d Windrush Duchess 4th (49878), s d Greystones Senior (8397).

—G. G. MYATT, Beechcroft, Kilminster, Axminster, Devon, **Kilminster Queen** (70348), born 12th June, 1921; s Kidborn Gamekeeper 4th (11343), d Fosbury Lady 6th (46700), s d Vahan Gitmax (11821).

CLASS 201.—Black Large Breeding Sow, not exceeding 12 months old on May 1, 1924. [20 entries].

I. (310.)—D. DOWLAND & SON, Moorcroft Farm, Lidsing, by Chatham, **Lidsing Ellenita**, born 6th June, 1923; s Maxwelltown Prince Charlie (15679), d Maxwelltown Duchess 4th (81394), s d Drayton Daniel (11615).

II. (25.)—A. P. COCKBURN, Stanborough, Halwell, Devon, **Stanborough Star 2nd**, born 7th July, 1923; s Awton Sampson, d Barton Pines Madge, s d Trevisquite Centre Foward.

III. (22.)—W. J. ACREMAN, Langland Farm, Catcott, Bridgwater, **Cornwood Lass 77th**, born 3rd May, 1923, bred by J. H. Glover, Cornwood, South Devon; s Tinten Sultan 5th (24537), d Cornwood Molly (49516), s d Fentongollan Naik (9455).

R.—MAJOR J. G. DUGDALE, Whiteway Farm, Cirencester, **Whiteway Mite 1st**, born 4th June, 1923; s Whiteway Mason (21821), d Swardeston Mite (79758), s d Cornwood King John (8271).

H.C.—C. C. PYKE, O.B.E., Capel Leyse, Holmwood, Surrey, **Holmwood Dunlia 4th** (113248), born 6th May, 1923, s Dunsfold Chief (22287), d Holmwood Amelia 2nd, s d Holmwood Miller 2nd (12717).

CLASS 202.—Pair of Large Black Breeding Sows, farrowed in 1924. [12 entries].

I. (27.)—MAJOR J. G. DUGDALE, Whiteway Farm, Cirencester, **Whiteway Duchess 25th and 26th**, born 1st January; s Cornwood Doonard (20621), d Whiteway Duchess 2nd (78860), s d Tinten Whiteway Venture (16877).

II. (24.)—C. C. PYKE, O.B.E., Capel Leyse, Holmwood, Surrey, **Holmwood Czarina 21st** (A.60) and **Holmwood Czarina 22nd** (A.22), born 5th January, 1924; s Runtley King Victor (23705), d Holmwood Czarina 7th (52938), s d Vahan Level Wonder (9061).

III. (22.)—H. J. WATSON, Hermongers, Rudgwick, Sussex, **Hermongers Harriet 8th** (A.14) and **9th** (A.16), born 3rd January; s Valley All Right (27261), d Hermongers Harriet 1st (78498), s d Drayton Champion Lad 1st (16447).

R.—B. M. EDE, Plurrenden, Woodchurch, Ashford, Kent, **Plurrenden Delia 8th and 9th**, born 2nd January, 1924; s Awton Sampson (21891), d Plurrenden Delia 3rd (98156), s d Plurrenden Laird (15339).

CHAMPION PRIZE.

Best Animal in Classes 200 to 202.

I.—J. H. GLOVER, J.P., Cornwood, South Devon, **Cornwood Progress** (53076), born 23rd June, 1920; s Cornwood Confessor (12967), d Cornwood Lass 56th (25732), s d Alfold Victor 2nd (6841).

R.—D. DOWLAND & SON, Moorcroft Farm, Lidsing, by Chatham, **Lidsing Ellenita**, born 6th June, 1923; s Maxwelltoun Prince Charlie (15679), d Maxwelltoun Duchess 4th (81394), s d Drayton Daniel (11615).

LARGE WHITE.

(£10 towards the Prizes in these Classes and the Champion Prize were given by the National Pig Breeders' Association).

CLASS 203.—*Large White Boar, farrowed in 1921, 1922 or 1923.*
[4 entries].

I. (210.)—W. WHITE & SONS, Pool Farm, Taunton, Somerset, **Spalding Signal** (34103), born 3rd January, 1921, bred by A. White, Hillegroom, Spalding; s Kinkmaker (24151), d Spalding Queen Mary 5th (61232), s d Banner of Spalding (21987).

II. (25.)—R. VERNON, Orchard Portman, Somerset, **Staple Monarch**, born 28th July, 1923; s Caldmore Jay (Vol. 38), d Taunton Lily 15th (Vol. 40), s d Copped Hall Clansman (23735).

CLASS 204.—*Large White Boar, farrowed in 1924.* [4 entries].

I. (27.)—L. E. HULLAND, Coneytrowe, Taunton, born 1st January; s Sportsman of Coneytrowe (Ear No. 3, Vol. 40), d Coneytrowe Queen (Ear No. 8, 77756), s d Copped Hall Clansman (Ear No. 25, 23735).

II. (24.)—W. WHITE & SONS, Pool Farm, Taunton, Somerset, **Taunton Signal 1st** (Vol. 41), born 1st January; s Spalding Signal (24103), d Taunton Amy 12th (93090), s d Taunton Araby 3rd (27325).

III. (22.)—Ditto, ditto, **Taunton Signal 2nd** (Vol. 41), born 7th January; s Spalding Signal (34013), d Taunton Countess 5th (70276), s d Taunton Araby 3rd (27325).

CLASS 205.—*Large White Breeding Sow, farrowed before 1924.*
[10 entries].

I. (210.)—W. WHITE & SONS, Pool Farm, Taunton, Somerset, **Taunton Amy** (81422), born 2nd July, 1920; s Histon Snowman (24047), d Histon Amy 6th (59812), s d Histon Lion Heart (22481).

II. (25.)—LIEUL.-COL. SIR C. MILES, Bart, Walton-in-Gordano, Clevedon, Somerset, **Histon Lady Marie**, born 29th May, 1922, bred by Chivers & Sons, Ltd., Histon, Cambridge; s Towgood Cantab (37791), d Cantab Royal Mistress (89360), s d Bourne Cantab (26069).

III. (22.)—W. WHITE & SONS, **Taunton Amy 2nd** (81424), born 2nd July, 1920; s Histon Snowman (24047), d Histon Amy 6th (59812), s d Histon Lion Heart (22481).

R.—CAPT. A. JACOBSON, Strangways Farm, West Hatch, Taunton, **Taunton Amy 24th** (93106), born 7th September, 1921, bred by W. White & Sons, Pool Farm, Taunton; s Copped Hall Clansman (23735), d Histon Amy 6th (59812), s d Histon Lion Heart (22481).

V.H.C.—L. E. HULLAND, Coneytrowe, Taunton, born 10th August, 1921; s Copped Hall Clansman (23735, Ear No. 25), d Pillsdon Queen 1st (60876, Ear No. 6).

C.—**R. VERNON**, Orchard Portman, Somerset, **Staple Duchess**, born 28th July, 1923; s **Caldmore Jay** (Vol. 38), d **Taunton Lily** 15th (Vol. 40), s d **Copped Hall Clansman** (23735).

CLASS 206.—*Pair of Large White Breeding Sows, farrowed in 1924.*
[6 entries].

I. (27.)—**W. WHITE & SONS**, Pool Farm, Taunton, **Taunton Amy** 64th and **Taunton Countess** 9th, born 5th and 7th January; s **Spalding Signal** (34103), d **Taunton Amy** 10th (Vol. 40), and **Taunton Countess** 9th (70276), s d **Taunton Emperor** (34227) and **Taunton Araby** 3rd (27325).

II. (24.)—Ditto, ditto, **Taunton Lady Amy** 1st and 2nd, born 1st January; s **Spalding Signal** (34013), d **Taunton Amy** 12th (93090).

III. (22.)—**L. E. HULLAND**, Coneytrowe, Taunton, born 3rd January; s **Sportsman of Coneytrowe** (Ear No. 3, Vol. 40), d **Coneytrowe Queen** (77750, Ear No. 4), s d **Copped Hall Clansman** (23735 Ear No. 25).

R.—**LIEUT.-COL. SIR C. MILES**, Bart., Walton-in-Gordano, Clevedon, Somerset, born 17th January; s **Histon Banner** 3rd, d **Gordano Rainbow**, s d **Gordano Thunder**.

C.—Ditto, ditto, born 1st January; s **Ramsey Turk** 14th (30297), d **Gordano Dewdrop** 2nd (78750), s d **Ramsey Turk** 14th (30297).

CHAMPION PRIZE.

A Gold Medal or £5, for the best Animal in Classes 203 to 206.

I.—**W. WHITE & SONS**, Pool Farm, Taunton, Somerset, **Taunton Amy** (81422), born 2nd July, 1920; s **Histon Snowman** (24047), d **Histon Amy** 6th (59812), s d **Histon Lion Heart** (22481).

R.—**LIEUT.-COL. SIR C. MILES**, Bart., Walton-in-Gordano, Clevedon, Somerset, **Histon Lady Marie**, born 29th May, 1922, bred by **Chivers & Sons, Ltd.**, Histon, Cambridge; s **Towgood Cantab** (37791), d **Cantab Royal Mistress** (89360), s d **Bourne Cantab** (26069).

MIDDLE WHITE.

(£10 towards the Prizes in these Classes and the Champion Prizes were given by the National Pig Breeders' Association).

CLASS 207.—*Middle White Boar, farrowed in 1921, 1922 or 1923.*
[22 entries].

I. (210.)—**MRS. SOFER WHITBURN**, Ampport St. Mary, Andover, Hants, **Scotty of Norsbury** (Vol. 40), born 15th August, 1921, bred by **S. Austin**; s **Scotty of Prestwood** (25533), d **Perne Clarice** (74452), s d **Peene Shrewsbury** (28213).

II. (25.)—**T. L. BONAR**, Preston Hall, Aylesford, Kent, **Ayle Woodman** 4th, born 1st March, 1923; s **Norsbury Woodman** (35461), d **Biddenden Beatrice** 6th (82508), s d **Keston Victor of Biddenden**.

III. (22.)—**M. GREENHILL**, Furnace Farm, Cowden, Kent, **Lonsdale Snowman**, born 10th June, 1923; s **Albany Ely** 4th, d **Rose of Lonsdale**, s d **Sidbury of Pullington**.

B.—**R. READHEAD**, Great House, Hambledon, Godalming, **Hermes of Hambledon** (38771, Vol. 39), born 15th February, 1922, bred by Major St. John Pigott and N. Conant, Burringfold, Dunsfold, Godalming; s **Hammonds Hermes** (31651), d **Histon Welcome** 8th (73452), s d **Histon Halo** (25339).

V.H.C.—**J. A. H. STANSFIELD**, Bates, Wittersham, Kent, **Wharncliffe Papyrus**, born 8th January, 1923, bred by South Yorkshire Asylum Committee, Sheffield; s **Wharncliffe Prince** (32625), d **Violet of Wharncliffe** (87618), s d **Dividend of Wharfedale** (20511).

H.C.—**W. J. CHINNECK**, Trobridge House, Crediton, Devon, **Hammonds Humorist**, born 4th January, 1923, bred by H. R. Beetön, Hammonds, Checkendon, Reading; s **Hammonds Perfection's Pride** (31675), d **Hagar** (51474), s d **Minister of Bladen** (20545).

C.—**MORGAN & WINTERSON**, Abberton, near Pershore, Worcestershire, **Dandy of Abberton**, born 15th April, 1922, bred by J. M. Bainbridge, Chilmington, Great Chart, Ashford, Kent; s **Peene of Chilmington** (35532), d **Chilmington Dolly** (82960), s d **Edenbridge Victor** (28003).

CLASS 208.—Middle White Boar, farrowed in 1924. [21 entries].

I. (27.)—**T. L. BONAR**, Preston Hall, Aylesford, Kent, **Ayle Kim**, born 2nd January; s **Histon Baron** 12th, d **Burningfold Peaceful** 4th (94912), s d **Hammonds Hermes**.

II. (24.)—**LORD LEWISHAM AND MAJOR W. L. PALMER, M.C.**, Godmersham Park, near Canterbury, born 8th January; s **Apollo of Wharfedale**, d **Histon Rosebud** 13th (84712) s d **Histon Shewsbury** 2nd (28081).

III. (22.)—**MORGAN & WINTERSON**, Abberton, near Pershore, **Abberton Bangus 4th**, born 1st January; s **Abberton Elligote** (Vol. 40), d **Abberton Choice** (93834), s d **Caldmore Joe** (38327).

R.—**S. BIDE & SONS, LTD.**, Pedigree Pig Farm, Farnham, Surrey, born 12th January; s **Wharncliffe Master** (Vol. 40), d **Compton Rosina** (Vol. 40), s d **Pendley King** (32179).

V.H.C.—**E. S. HULLAND**, Farthings, Coneytrowe, Taunton, born 2nd January; s **Woodman of Farthings** (Vol. 40, Ear No. 330), d **Caroline of Nobsbury** 4th (95086), s d **Keston Rcnuk** (31983).

H.C.—**J. A. H. STANSFIELD**, Bates, Wittersham, Kent, born 3rd January; s **Wharncliffe Prince** (32625), d **Oxney Choice** 2nd (862. 2), s d **Midlothian Rover** (32075).—**MRS. SOFER WHITBURN**, Ampport St. Mary, Andover, Hants, **Ampport Bellman**, born 10th January; s **Scotty of Norsbury** (Vol. 40), d **Addington Bella** 7th (93942), s d **Adventurer of Addington** (27749).

C.—**H. LAKE**, Combe Lancey, Crediton, Devon, **Combancey Reveller** (Ear No. 4), born 2nd January; s **Preston Albert** 5th (39285), d **Combancey Dahlia**.

CLASS 209.—Middle White Breeding Sow, farrowed before 1924. [29 entries].

I. (210.)—**MRS. HAYES SADLER**, Norsbury, Sutton Scotney, Hants, **Norsbury Welcome 5th** (Vol. 40), born 5th January, 1923; s **Scotty of Norsbury** (Vol. 40), d **Histon Welcome** 9th (73456), s d **Histon Halo** (25339).

II. (25).—W. T. B. CARTRIDGE, Sidbury, Worcester, **Sidbury Cleopatra** (87204), born 15th July, 1921; s Pendley Swell (32183), d Violet of Beenham (57284), s d Hammonds Moonbeam (21691).

III. (22).—MRS. SOFER WHITBURN, Amport St. Mary's, Andover, Hants, **Amport Bella 14th**, born 2nd March, 1923; s Scotty of Norsbury (Vol. 40), d Addington Bella 7th (93942), s d Adventurer of Addington (27749).

R.—W. J. CHINNECK, Trobridge House, Crediton, Devon, **Choice of Hammonds 4th**, born 3rd March, 1923, bred by Major H. S. Morris, Barkham, near Wokingham, Berks; s Wharfedale Hector (35879), d Histon Choice 24th (84568), s d Histon Wanderer (25349).

V.H.C.—J. A. BLACKMORE, Palmers, Clayhidon, Devon, **Palmers Daisy**, born 9th March, 1923; s Crusader of Palmers (Vol. 40), d Harveston Molly (72990), s d Histon Bugler 2nd (31757).

H.C.—JOWITT & SIMPSON, Burford House, Shepton Mallet, **Burford Auricula**, born 8th June, 1923; s Wharfedale Abner (39651), d Burford Lilac (94882), s d Swythamley Albany Lad 2nd (35811).—MRS. SOFER WHITBURN, **Prosperous of Neuburie** (Vol. 40), born 13th January, 1923, bred by Major E. J. Hudson, Hungerford, Berks; s Pendley Swell (32183), d Violet of Prosperous (87614), s d Histon Wanderer (25349).

C.—APLIN AND BARRETT AND THE WESTERN COUNTIES CREAMERIES, LTD., Yeovil, **Tilly of Keinton 2nd** (Vol. 40), born 2nd January, 1923, bred by W. H. S. Hodgson, Morebath, Devon; s Edenbridge Viscount 4th (38529), d Edenbridge Peerless 7th (95782), s d Edenbridge Bonny Boy (31519).—K. D. BRIGGS, Robin's End, Tenbury, Wells, Worcs., **Neuburie Aquilegia** (99030), born 2nd August, 1922, bred by Capt. Angier, Newbury; s Wharfedale Hector (35879), s Henley Amy (75284), s d Hope of Hammonds (25361).

CLASS 210.—*Pair of Middle White Breeding Sows, farrowed in 1924.*
[23 entries].

I. (27).—MORGAN & WINTERSON, Abberton, near Pershore, Worcs., **Abberton Bascilia 9th and 11th**, born 1st January; s Abberton Elligote (Vol. 40), d Abberton Choice (93834), s d Caldmore Joe (38327).

II. (24).—T. L. BONAR, Preston Hall, Aylesford, Kent, **Ayle Kimona and Ayle Kimona 2nd**, born 2nd January; s Histon Baron 12th, d Burningfold Peaceful 4th, s d Hammonds Hermes.

III. (22).—S. BIDE & SON, LTD., Pedigree Pig Farm, Farnham, Surrey, born 12th January; s Wharncliffe Master (Vol. 40), d Compton Rosina (Vol. 40), s d Pendley King (32179).

R.—MRS. SOFER WHITBURN, Amport St. Mary's, Andover, Hants, born 9th January; s Scotty of Norsbury (Vol. 40), d Oxney Glossy 14th (99236), s d Prestwood Acrobat 1st (23197).

V.H.C.—T. A. PEERS, Thorncroft, Farnham, Surrey, born 5th January; s Nonsuch of Whyteleafe (35457), d Mascot of Thorncroft (98554), s d Prestwood Boaz of Bookham (20565).

H.C.—H. LAKE, Combe Lancey, Crediton, Devon, **Combelaacey Primrose 1st and Combelaacey Bountiful 5th** (Ear No: 24), born 27th January and 2nd January; s Preston Albert 5th (39285), d Trobridge Muriel 2nd (101206) and Combelaacey Dahlia, s d Histon Dart (35151).
—LIEUT.-COL. H. SPENDER-CLAY, M.P., Ford Manor, Lingfield, Surrey

(Ear Nos. 443 and 447), born 3rd January; s Shipley Royal Show (35707), d Edenbridge May Queen (83496), s d Weeley of Shrewsbury (23267).

C.—W. T. B. CARTRIDGE, Sidbury, Worcester, born 1st January; s Sidbury Corinthian (Vol. 40), d Prestwood Mary 14th (99578), s d Prestwood David 6th (28233).—**LORD LEWISHAM AND MAJOR W. L. PALMER, M.C.**, Godmersham Park, near Canterbury, born 3rd January; s Apollo of Wharfedale (225, Vol. 40), d Shipley Peeress (75316), s d Pendley King (32179).

CHAMPION PRIZE.

A Gold Medal or £5 for the best Animal in Classes 207 to 210.

I.—**MRS. HAYES SADLER**, Norsbury, Sutton Scotney, Hants, **Norsbury Welcome 5th** (Vol. 40), born 5th January, 1923; s Scotty of Norsbury (Vol. 40), d Histon Welcome 9th (73456), s d Histon Halo (25339).

P.—W. T. B. CARTRIDGE, Sidbury, Worcester, **Sidbury Cleopatra** (87204), born 15th July, 1921; s Pendley Swell (32183), d Violet of Beenham (57284), s d Hammonds Moonbeam (21691).

GLoucestershire Old Spots.

(£40 towards the Prizes in these Classes were given by the Gloucestershire Old Spots Pig Society).

CLASS 211.—*Gloucestershire Old Spots Boar, farrowed before 1923.*
[3 entries].

I. (210.)—**SIR F. H. BATHURST**, Bart., D.S.O., Somborne Park, Winchester, **Pevensey Bruce 1st** (4283), born 6th April, 1921, bred by H. B. Brassey; s Dinedor Beau (Vol. 7), d Heythrop Daisy 2nd (6710), s d Winterbourne Blanco (483).

II. (25.)—**O. R. BAGNALL**, The Howsells, Malvern Link, **Howsell Actor**, born 17th January, 1922; s Gilslake Sportsman (2597), d Cleevehill Princess (11334), s d Sultan 4th of Hollywood Tower (461).

III. (22.)—**BENNETT & HOWARD**, Quarry Farm, Thornbury, Glos., **Ayot Page** (5069), born 22nd August, 1922, bred by Miss Cory-Wright, Welwyn, Herts; s Chalfont Pilot (4064), d Croxton Fiction 16th (7340), s d Hobwell Monarch (1028).

CLASS 212.—*Gloucestershire Old Spots Boar, farrowed in 1923.*
[9 entries].

I. (210.)—**J. D. BEAK**, Maiden Bradley, Bath (Wilts), **Maiden Bradley General 2nd** (5277), born 27th February; s Ashton Dapper (4627), d Dinedor Barmaid (8390), s d Cleevehill Actor (664).

II. (25.)—**S. H. BADOCK**, J.P., Holmwood, Westbury-on-Trym, Bristol, **Holmwood Standard** (5395), born 3rd May; s Kitesnest Punch (4835), d Holmwood Fancy (16470), s d Holmwood Domino (4277).

III. (22.)—**F. H. TURNBULL**, Lower House Farm, Llantwit Major, **Llantwit Hero 2nd** (5347), born 11th May; s Llantwit Beltane (4668), d Clapcote Ada 1st (15707), s d Eastern Sunstar (3173).

V.H.C.—SIR F. H. BATHURST, Bart., D.S.O., Somborne Park, Winchester, **Somborne Plume**, born 16th July; s Downside King (4963), d Somborne Anice 2nd (5396), s d Ashley Archer (4295).—ALDERMAN H. MATTHEWS, Down Farm, Winterbourne, Bristol, **Clapcote Masterpiece** (5228), born 5th January, bred by R. H. Hole, Clapcote Farm, Grittleton; s Llantwit Beltane (4668), d Alveston Ruby 4th (14193), s d Lawnes President (3869).

CLASS 213.—Gloucestershire Old Spots Boar, farrowed in 1924
[10 entries].

I. (27).—BENNETT & HOWARD, Quarry Farm, Thornbury, Glos., **Thornbury Barone**, born 8th January; s Ayot Page (5069), d Thornbury Barone (15783), s d Ashton Bloomer (1749).

II. (24).—SIR F. H. BATHURST, Bart., D.S.O., Somborne Park, Winchester, **Somborne Sir Galahad**, born 9th February; s Somborne Major (4679), d Wye Goodlass (7856), s d Stoke Courcey Harry (1004).

III. (22).—F. H. TURNBULL, Lower House Farm, Llantwit Major, **Llantwit Clown**, born 21st January; s Llantwit Boy (4361), d Huntingford Countess 3rd (12826), s d Ethells Major 2nd (2084).

V.H.C.—SIR F. H. BATHURST, Bart., D.S.O., **Somborne Harold**, born 17th January; s Downside King (4963), d Somborne Anita 6th (16391), s d Langston Sam (4665).—J. D. BEAK, Maiden Bradley, Bath, **Maiden Bradley General 2nd**, born 2nd January; s Ashton Dapper (4627), d Maiden Bradley Barmaid (14640), s d Maiden Bradley Champion 1st (3858).

CLASS 214.—Gloucestershire Old Spots Breeding Sow, farrowed before 1923. [8 entries].

I. (210).—ALDERMAN H. MATTHEWS, Down Farm, Winterbourne, **Thornbury Ballet Girl** (13710), born 18th June, 1921, bred by Bennett & Howard, Quarry Farm, Thornbury, Glos.; s Ashton Bloomer, d Thornbury Begum (8941), s d Gilslake Admiral (907).

II. (25).—BENNETT & HOWARD, Quarry Farm, Thornbury, Glos., **Thornbury Waterlady** (15778), born 3rd January, 1922; s Ashton Bloomer (1741), d Thornbury Waterlily (8939), s d Gilslake Admiral (907).

III. (22).—H. W. BERRY, Blackmoor Farm, Langford, near Bristol, **Langford Princess 3rd** (16763), born 12th July, 1922; s Langforde Spotted Dick 1st (4579), d Langforde Princess 1st (13270), s d Langforde Ben (1646).

V.H.C.—SIR F. H. BATHURST, Bart., D.S.O., Somborne Park, Winchester, **Pylewell Belinda**, born 22nd April, 1921, bred by W. J. Whitaker Pylewell Park, Lymington, Hants; s Ashton Bloomer (1741), d Clevehill Dimple (11330), s d Sultan 4th of Hollywood Tower (462).—Ditto, **Dorset Mealy** (17115), born 26th July, 1922, bred by H. Francis & Son, East Knoyle, Salisbury; s Dorset Chief (4399), d Dorset Lily (14744), s d Oaklease Edwin (597).

CLASS 215.—*Gloucestershire Old Spots Breeding Sow, farrowed in 1923. [12 entries].*

I. (£10.)—J. D. BEAK, Maiden Bradley, Bath, **Maiden Bradley Maid 3rd** (17492), born 25th April; s Ashton Dapper (4627), d Maiden Bradley Barmaid (8390), s d Maiden Bradley Champion 1st (3858).

II. (£5.)—Ditto, ditto, **Maiden Bradley Maid** (17490), born 20th February; s Ashton Dapper (4627), d Maiden Bradley Barmaid 2nd (14641), s d Maiden Bradley Champion 1st (3858).

III. (£2.)—O. R. BAGNALL, The Howsells, Malvern Link, **Howsell Countess**, born 5th April; s Knowle Viscount (4644), d Cleevehill Princess (11334), s d Sultan 4th of Hollywood Tower (461).

V.H.C.—Ditto, ditto, **Howsell Duchess**, born 5th April; s Knowle Viscount (4644), d Cleevehill Princess (11334), s d Sultan 4th of Hollywood Tower (461).—A. ROOKSBY, Litchard Hall, Bridgend, born 7th July; s Litchard Mischief, d Huntingford Susie.

CLASS 216.—*Pair of Gloucestershire Old Spots Breeding Sows, farrowed in 1924. [9 entries].*

I. (£7.)—BENNETT & HOWARD, Quarry Farm, Thornbury, Glos., **Thornbury Bar-two** and **Thornbury Bar-three**, born 8th January; s Ayot Page (5069), d Thornbury Bar-nine (15781), s d Ashton Bloomer (1741).

II. (£4.)—J. D. BEAK, Maiden Bradley, Bath, **Maiden Bradley Spot 1st** and **2nd**, born 1st March; s Ashton Dapper (4627), d Maiden Bradley Dolly 3rd (14644), s d Clapcote Leader (1863).

III. (£2.)—F. H. TURNBULL, Lower House Farm, Llantwit Major, **Llantwit Ann** and **Llantwit Adelaide**, born 16th January; s Stoke Hill Magnet (4516), d Clapcote Ada 1st (15707), s d Eastern Sunstar (3173).

V.H.C.—A. ROOKSBY, Litchard Hall, Bridgend, born 7th February; s Litchard Mischief, d Maiden Bradley Peerless, s d Clapcote Leader (1863).

CHAMPION PRIZES.

GIVEN THROUGH THE GLOUCESTERSHIRE OLD SPOTS PIG SOCIETY.

The Sir George Watson Challenge Cup, value £21, for the best Animal in Classes 211 to 216. (The Cup to be won three times by the same Exhibitor with different animals before becoming his own property.)

I.—ALDERMAN H. MATTHEWS, Down Farm, Winterbourne, **Thornbury Ballet Girl** (13710), born 18th June, 1921, bred by Bennett & Howard, Quarry Farm, Thornbury, Glos.; s Ashton Bloomer, d Thornbury Begum (8941), s d Gilslake Admiral (907).

R.—SIR F. H. BATHURST, Bart., D.S.O., Somborne Park, Winchester, **Pevensey Bruce 1st** (4283), born 6th April, 1921, bred by H. B. Brassey; s Dinedor Beau (Vol. 7), d Heythrop Daisy 2nd (6710), s d Winterbourne Blanco (483).

The Deane-Drummond Cup, value £14 14s., for the best Boar in Classes 211 to 213. (The Cup to be won twice by the same Exhibitor with different animals before becoming his own property.)

I.—SIR F. H. BATHURST, Bart., D.S.O., Somborne Park, Winchester, **Pevensey Bruce 1st** (4283), born 6th April, 1921; bred by H. B. Brassey s Dinedor Beau (Vol. 7), d Heythrop Daisy 2nd (6710), s d Winterbourne Blanco (483).

R.—J. D. BEAK, Maiden Bradley, Bath (Wilts), **Maiden Bradley General 2nd** (5277), born 27th February; s Ashton Dapper (4627), d Dinedor Barmaid (8390), s d Clevehill Actor (664).

The Sir John Anderson Challenge Cup, for the best Sow in Classes 214 to 216. (The Cup to be won twice by the same Exhibitor with different animals before becoming his own property.)

I.—ALDERMAN H. MATTHEWS, Down Farm, Winterbourne, **Thornbury Ballet Girl** (13710), born 18th June, 1921, bred by Bennett and Howard, Quarry Farm, Thornbury, Glos.; s Ashton Bloomer, d Thornbury Begum (8941), s d Gilslake Admiral (907).

R.—J. D. BEAK, Maiden Bradley, Bath, **Maiden Bradley Maid 3rd** (17492), born 25th April; s Ashton Dapper (4627), d Maiden Bradley Barmaid (8390), s d Maiden Bradley Champion 1st (3858).

WESSEX SADDLEBACK.

(£24 towards the Prizes in these Classes and the Special Prizes were given by the Wessex Saddleback Pig Society, and all pigs exhibited must be entered or eligible for entry in that Society's Herd Book.

CLASS 217.—Wessex Saddleback Boar, farrowed in 1923. [11 entries].

I. (£10.)—A. HOPE, West Sidborough, Tiverton, **Sidborough Oberon** (H.B. No. 1712), born 20th March; s Norman Perfection (660), d Sidborough Titania (4890), s d Pearash Luther (332).

II. (£5.)—MAJOR A. BREWIS, Overton, Hants, **Oakley Prior**, born 8th January; s Ashe Major (1219), d Oakley Prioress (4599), s d Norman Polham (661).

III. (£2.)—DR. W. H. FORSHAW, Slythhurst, Ewhurst, Guildford, Surrey, **Slythhurst Robin Hood** (1693), born 12th January; s Slythhurst Royal Oak (934), d Slythhurst Bracken (4938), s d Ashe Mac 2nd (680).

V.H.C.—R. N. TORV, Anderson, Blandford, Dorset, **Anderson Champion 2nd** (1761), born 2nd January; s Melcombe Napier (670), d Anderson Mary 1st (1855), s d Cattistock Norman 6th.

CLASS 218.—Wessex Saddleback Boar, farrowed in 1924. [11 entries].

I. (27.)—DR. W. H. FORSHAW, Slythehurst, Ewhurst, Guildford, Surrey, **Slythehurst Present King**, born 2nd January; s Norman King Offa (219), d Slythehurst Bracken (4938), s d Ashe Mac 2nd (680).

II. (24.)—CAPT. L. BOYNE, Holnest, Farway, Colyton, Devon, **Holnest Agrippa**, born 9th January; s Sidborough Lysander (1089), d Woodbridge Dew (4611), s d Romsey Rex (478).

III. (22.)—G. R. SOUTHWELL, Holbury Farm, Lockerley, Romsey, Hants, **Holbury Pilot**, born 9th January; s Holbury Elect. (1888), d Holbury Pink (5782), s d Norman Perfection (660).

V.H.C.—MAJOR A. BREWIS, Overton, Hants, **Oakley Factor 2nd**, born 4th January; s Oakley Prior (1678), d Oakley Satisfaction (5100), s d Norman Polham (661).

CLASS 219.—Wessex Saddleback Breeding Sow, farrowed before 1923. [10 entries].

I. (210.)—C. CORAM, Hartnolls, Tiverton, Devon, **Westbury Blanche 11th** (5407), born 29th May, 1922, bred by Col. Phillips, Hitchin, Herts; s Godalming Duke (581), d Purbeck Perfection (753), s d Purbeck Blanche (81).

II. (25.)—G. R. SOUTHWELL, Holbury Farm, Lockerley, Romsey, Hants, **Holbury Leek** (5780), born 8th July, 1922; s Norman Perfection (660), d Holbury Loo (996), s d Screech Hill Stephen (140).

V.H.C.—MAJOR A. R. WHITTINGTON, D.S.O., Yarty, Axminster, Devon, **Yarty Empress 3rd** (4441), born 7th May, 1921; s Yarty Prince 1st (539), d Yarty Nora 2nd (2193), s d Screech Hill Stephen (140).

CLASS 220.—Wessex Saddleback Breeding Sow, farrowed in 1923. [20 entries].

I. (210.)—A. HOPE, West Sidborough, Tiverton, **Sidborough Pear-blossom** (8814), born 24th February; s Sidborough Snout (1189), d Sidborough Ophelia (5672), s d Pearash Luther (332).

II. (25.)—G. R. SOUTHWELL, Holbury Farm, Lockerley, Romsey, Hants, **Holbury Eva** (9876), born 15th January; s Godalming Mac (1337), d Holbury Eveline (5775), s d Norman Perfection (660).

III. (22.)—A. HOPE, **Sidborough Gertrude** (8813), born 21st January; s Norman Perfection (660), d Partridge of Sidborough (8805), s d Brighstone Premier (339).

V.H.C.—MISSSES BEDFORD, The Forge, Upton-on-Severn, **Maxstoke Cordelia**, born 1st August; s Eastington Primate (578), d Maxstoke Ophelia 1st (6304), s d Lad of Homedown (759).

H.C.—A. HOPE, **Sidborough Cobweb** (8816), born 24th February; s Sidborough Snout (1189), d Sidborough Ophelia (5672), s d Pearash Luther (332).

Prizes awarded to Wessex Saddleback & Welsh Pigs. lxxxiii

CLASS 221.—*Pair of Wessex Saddleback Breeding Sows, farrowed in 1924.* [14 entries].

I. (#7).—CAPT. L. BOYNE, Holnest, Farway, Colyton, Devon, **Holnest Amida**, born 20th January; s Sidborough Lysander (1089), d Holnest Netta (6200), s d Dauntsey Premier (242); and **Holnest Lydia**, born 4th January; s Sidborough Lysander (1089), d Holnest Loana (5262), s d Dauntsey Premier (242).

II. (#4).—MAJOR A. R. WHITTINGTON, D.S.O., Yarty, Axminster, Devon, **Yarty Daisy 5th** and **Yarty Daisy 6th**, born 10th January; s Yarty Prince 2nd (1301), d Yarty Daisy 2nd (2179), s d Yarty Prince 1st (539).

III. (#2).—J. S. FOLLETT, Hemyock Place, Hemyock, born 4th January; s Melchet Jingo 2nd (1185), d Hemyock Lucy (5331), s d Eastington Trumps (276).

V.H.C.—MISSSES BEDFORD, The Forge, Upton-on-Severn, Worcs., **Maxstoke Pomade** and **Maxstoke Pomatum** (10831 and 10832), born 12th January; s Norman Polham (661), d Maxstoke Ophelia 1st (6304), s d Lad of Homedown (759).

H.C.—MAJOR A. BREWIS, Overton, Hants, **Oakley Satisfaction 2nd** and **Oakley Satisfaction 3rd**, born 4th January; s Oakley Prior, d Oakley Satisfaction, s d Norman Polham.

GOLD MEDAL.

Value £5 5s., for the best Pig exhibited in Classes 217 to 221, and a Silver Medal to the Breeder who was not the exhibitor of the Animal winning the Gold Medal.

I.—A. HOPE, West Sidborough, Tiverton, **Sidborough Pearblossom**, (8814), born 24th February; s Sidborough Sncut (1180), d Sidborough Ophelia (5672), s d Pearash Luther (332).

WELSH.

(£10 towards the Prizes in these Classes were given by the Welsh Pig Society).

CLASS 222.—*Welsh Boar, any age.* [1 entry].

I. (#10).—MRS. M. EVANS & SONS, Parsonage, Llanboidy, Whitland, **Cawr Taf**, born 13th July, 1922, bred by J. Davies, Taf, Hebron S.O.; s Llew Taf (13, Vol. 1), d Tigen Susi (342, Vol. 2), s d Glandy Thou.

CLASS 223.—*Welsh Breeding Sow, farrowed before June 1, 1923.* [1 entry].

L. (#10).—D. P. BARNETT, Walterston, Llancairian, Cowbridge, **Walterston Queen**, born 6th February, 1920, bred by W. Morgan, Mardy Newydd, Bonvilston, Cardiff; s Maisyward General, d Brynteg Lassic.

CLASS 224.—*Welsh Breeding Sow, born after June 1, 1923.* [1 entry].

L. (#7).—D. P. BARNETT, Walterston, Llancairian, Cowbridge, **Walterston Fairy Queen**, born 15th June, 1923; s Pengolly President, d Walterston Queen, s d Maisyward General.

LONG WHITE LOP-EARED.

(£20 towards the Prizes in these Classes were given by the Long White Lop-Eared Pig Society).

CLASS 225.—*Long White Lop-Eared Boar, farrowed on or before October 1, 1923. [8 entries].*

I. (£10.)—W. H. NEAL, Yealmpstone Farm, Plympton, **Quither Masterpiece** (122), born 5th July, 1921, bred by W. Mashford, Milton Abbot; s Quither General, d Quither Dainty 2nd.

II. (£5.)—G. H. SHEPHEARD, Lukesland, Ivybridge, **Lukesland Hero** (342), born 19th April, 1922.

III. (£2.)—W. J. WESTLAKE, Godwell, Ivybridge, South Devon, **Godwell Senator**, born 27th July, 1923; s Right Sort (164), d Godwell Sunshine (1895).

R.—MAJOR E. G. WELDON, Tracey, Honiton, Devon, **Hardicott Masher** (478), born 7th July, 1923, bred by F. Wonnacott, Hardicott, Milton Abbot; s Moorlam Boss (264), d Hardicott Nora (653), s d Quither General (2).

CLASS 226.—*Long White Lop-Eared Boar, farrowed since October 1, 1923. [6 entries.]*

I. (£7.)—A. A. PARTRIDGE, Mordref, Plympton, **Priory Marvel** (578), born 12th October 1923; s Forda Marvel (268), d Priory Lassie (823), s d Quither Masterpiece (122).

II. (£4.)—W. J. WESTLAKE, Godwell Farm, Ivybridge, South Devon, **Godwell Surveyor**, born 20th October, 1923; s Lukesland Hero (342), d Godwell Bluebell (1397).

III. (£2.)—W. H. NEAL, Yealmpstone Farm, Plympton, **Yealmpstone Premier**, born 2nd January, 1924; s Yealmpstone Masterman, d Yealmpstone Princess, s d Quither General.

R.—H. TOPE, jun., Belsford, Harberton, Totnes, **Harberton Defiance**, born 3rd January, 1924; s Netherton Defender, d Harberton Bo-peep.

CLASS 227.—*Long White Lop-Eared Sow, any age, in farrow, or with farrow not exceeding 8 weeks old on the first day of the Show. [8 entries].*

I. (£10.)—A. A. PARTRIDGE, Mordref, Plympton, **Forlands Amiable** (159), born 14th March, 1921, bred by T. Spry, Tavistock; s Roborough Jumbo (20), d Netherton Sara (157).

II. (£5.)—W. H. NEAL, Yealmpstone Farm, Plympton, **Milton Chieftainess**, born 25th May, 1918, bred by J. Runnall; s Gratton Boar.

III. (£2.)—H. TOPE, jun., Belsford, Harberton, Totnes, **Harberton Bo-peep**, born 27th July, 1922.

CLASS 228.—*Long White Lop-Eared Sow, farrowed since March 1, 1923. [7 entries].*

I. (£7.)—A. A. PARTRIDGE, Mordref, Plympton, **Priory Mill Maid** (1149), born 30th March, 1923; s Quither Masterpiece (122), d Forlands Anxious (162), s d Roborough Jumbo (20).

Prizes awarded to Large White Lop-Eared Pigs & for Cider. lxxxv

II. (24.)—W. J. WESTLAKE, Godwell, Ivybridge, **Lop-ear Gilt**, born 27th July, 1923; s Right Sort (164), d Godwell Sunshine (1895).

III. (22.)—MAJOR E. G. WELDON, Tracey, Honiton, **Tracey Whisk** (2193), born 15th June, 1923; s Tracey Witness (276), d Tracey Winsome (1353), s d Netherton Surprise (46).

CLASS 229.—*Pair of Long White Lop-Eared Breeding Sows, farrowed in 1924. [8 entries].*

I. (27.)—H. TOPE, jun., Belsford, Harberton, Totnes, **Harberton Dawn** and **Harberton Dusk**, born 3rd January; s Netherton Defender, d Harberton Bo-peep.

II. (24.)—W. H. NEAL, Yealmpstone Farm, Plympton, born 12th February; s Milton Someday, d Brook House Fame.

III. (22.)—W. J. WESTLAKE, Godwell, Ivybridge, South Devon, born 3rd January; s Right Sort (164), d Godwell Sunshine (1895).

R.—MAJOR E. G. WELDON, Tracey, Honiton, Devon, born 7th January; s Tracey Witness (276), d Tracey Wist (407), s d Netherton Surprise (46).

PRODUCE.

CIDER.

(Open to Growers or Makers).

CLASS 230.—*Novice Class. Cask of not less than 9 and not more than 30 gallons of Cider, made in 1923 by an Exhibitor who had not previously taken a first prize in any public exhibition. [5 entries].*

I. (25.)—H. C. HANCOCK.

II. (23.)—WILLIAMS BROS.

III. (22.)—J. B. TAYLOR.

R.—H. J. STONE.

CLASS 231.—*Cask of not less than 9 and not more than 30 gallons of Cider, made in 1923, of a specific gravity not exceeding 1.015 at 60 deg. Fahr. [5 entries].*

I. (25.)—PULLIN BROS.

II. (23.)—H. J. DAVIS.

III. (22.)—H. J. DAVIS.

R.—PULLIN BROS.

CLASS 232.—*12 Quart Bottles of Cider, made in 1923, of a specific gravity not exceeding 1.015 at 60 deg. Fahr. [6 entries].*

I. (25.)—PULLIN BROS.

II. (23.)—H. J. DAVIS.

III. (22.)—PULLIN BROS.

R.—J. M. PARRY & Co.

CLASS 233.—*Cask of not less than 9 and not more than 30 gallons of Cider, made in 1923.* [12 entries].

- I. (£5.)**—PULLIN BROS.
- II. (£3.)**—PULLIN BROS.
- III. (£2.)**—QUANTOCK VALE CIDER CO. (LD.).
- R.**—E. W. LANGFORD (LD.).
- V.H.C.**—H. J. DAVIS.
- C.**—J. B. TAYLOR.

CLASS 234.—*12 Quart Bottles of Cider, made in 1923.* [13 entries].

- I. (£5.)**—E. W. LANGFORD (LD.).
- II. (£3.)**—H. J. DAVIS.
- III. (£2.)**—PULLIN BROS.
- R.**—PULLIN BROS.
- V.H.C.**—WILLIAMS BROS.
- C.**—BLEDISLOE FRUIT FARMS (LD.).—H. J. DAVIS.—QUANTOCK VALE CIDER CO. (LD.).

CLASS 235.—*12 Quart Bottles of Cider, made in any year previous to 1923.* [9 entries].

- I. (£5.)**—H. J. DAVIS.
- II. (£3.)**—H. C. HANCOCK.
- III. (£2.)**—QUANTOCK VALE CIDER CO. (LD.).
- R.**—PULLIN BROS.
- V.H.C.**—PULLIN BROS.
- C.**—A. I. MORRIS.

CHEESE.

CLASS 236.—*Three Cheddar Cheeses (not less than 56 lbs. each), made in 1923.* [23 entries].

- I. (£15.)**—MISS S. J. STEEDS.
- II. (£10.)**—MRS. C. NAISH.
- III. (£5.)**—MISS M. PORCH.
- R.**—COL. M. LOCK BLAKE.
- V.H.C.**—W. H. COLLINS.
- H.C.**—E. WHITE.
- C.**—G. R. COLE.

CLASS 237.—*Novice Class. Three Cheddar Cheeses, not over 56 lbs. each, made in 1923 by an Exhibitor who had not previously won a prize for Cheese at the London Dairy Show or the Shows of the Royal Agricultural or Bath and West Society.* [9 entries].

I. (£8.)—MRS. C. NAISH.

II. (£5.)—CARY & GRIMSDALL.

III. (£3.)—C. J. COOK.

R.—G. R. COLE.

V.H.C.—A. C. WYATT.

CLASS 238.—*Three Cheddar Cheeses (not over 56 lbs. each), made in 1923.* [19 entries].

I. (£10.)—MRS. S. J. STEEDS.

II. (£7.)—MRS. C. NAISH.

III. (£4.)—W. H. COLLINS.

R.—M. M. TABOR.

V.H.C.—S. T. WHITE

H.C.—H. H. PICKFORD.

C.—G. R. COLE.

CLASS 239.—*Four Loaf or other Truckle Cheeses, made in 1923.* [20 entries].

I. (£5.)—MRS. C. NAISH.

II. (£3.)—W. B. WHITE.

III. (£2.)—MRS. S. J. STEEDS.

R.—E. WALKER.

V.H.C.—P. W. BRAKE.

H.C.—F. PORTCH.

C.—H. H. PICKFORD.

CLASS 240.—*Three Caerphilly Cheeses, made in 1924.* [10 entries].

I. (£5.)—COX & SONS.

II. (£3.)—CHEDDAR VALLEY DAIRY CO.

III. (£2.)—A. F. SOMERVILLE.

R.—N. COOK.

V.H.C.—UNITED DAIRIES (LD.).

(The Prizes in Classes 241 to 243 were given by the Somerset County Council).

CLASS 241.—*Three Cheddar Cheeses, made by Students who had received instruction provided by the County Council.* [9 entries].

I. (£6.)—MISS B. COLES.

II. (£3.)—MISS E. G. F. ATYEO.

III. (£2.)—MISS R. M. SPARKS.

R.—C. J. COOK.

V.H.C.—E. WALKER.

lxxxviii Prizes awarded for Cheese, Cream Cheese, Butter & Cream.

CLASS 242.—*Three Caerphilly Cheeses, made by persons who had received instruction in Cheese-making provided by the County Council.* [2 entries].

II. (£3.)—E. CHEDGZEY.

CLASS 243.—*Three Caerphilly Cheeses, made by persons occupying a Small Holding of not more than 50 acres in Somerset.* [1 entry].

II. (£3.)—N COOK.

OREAM CHEESE, BUTTER AND OREAM.

(The Classes were not open to Professional Teachers).

CLASS 244.—*Three Cream or other Soft Cheeses.* [4 entries].

I. (£3.)—T. R. BOLITHO.

II. (£2.)—TREWITHEN DAIRY.

CLASS 245.—*2lbs. of Fresh (or very slightly salted) Butter.* [32 entries].

I. (£4.)—MRS. L. R. MILDON.

II. (£3.)—MRS. M. HEYWOOD.

III. (£2.)—MRS. L. MATTHEWS

IV. (£1.)—MRS. L. LEARMOUTH

R.—SIR R. A. MORRIS, Bart.

V.H.C.—EARL OF MOUNT EDGCUMBE.

H.C.—A. F. SOMERVILLE.

CLASS 246.—*2lbs. of Butter, in the making of which no salt had been used, judged on the last day of the Show.* [24 entries].

I. (£4.)—A. F. SOMERVILLE.

II. (£3.)—MRS. L. R. MILDON

III. (£2.)—MRS. M. HEYWOOD

IV. (£1.)—EARL OF MOUNT EDGCUMBE.

R.—A. C. BISHOP.

V.H.C.—MRS. L. LEARMOUTH.—MRS. L. MATTHEWS.

H.C.—R. J. DENNING.

CLASS 247.—*12lbs. of Keeping Butter, in a jar or crock, delivered to the Secretary 4 weeks before the Show.* [6 entries].

I. (£5.)—A. F. SOMERVILLE.

II. (£4.)—MRS. E. CARTER.

III. (£3.)—MRS. M. HEYWOOD.

CLASS 248.—*Four half-pounds of Scalded Cream.* [9 entries].

I. (£3.)—MRS. F. VICARY.

II. (£2.)—MRS. L. R. MILDON.

III. (£1.)—W. BEER.

R.—MRS. W. R. BEER.

COMPETITIONS.

BUTTER-MAKING.

(No Winner of a first prize given by this Society for Butter-making during the last three years was eligible to compete in Class 251 or 252).

CLASS 249.—*For Children under 14 years of age, attending School. On the 1st day of the Show—First prize, £3—second, £2—third, £1—fourth, 10s.*

[NO ENTRY.]

CLASS 250.—*Novice Class. For Competitors who had not hitherto won a prize for Butter-making at the London Dairy Show or the Shows of the Royal Agricultural or Bath and West Society. On the 2nd day of the Show. [20 entries].*

I. (£4.)—MISS D. M. WILLIAMS.

II. (£3.)—MISS R. E. MITCHELL.

III. (£1 10s.)—MISS K. DAVIES.

IV. (£1.)—MISS J. M. PRISK.

R.—MISS F. WATTS.

V.H.C.—MISS L. HOSKING.

H.C.—MISS F. M. PRISK.

CLASS 251.—*Butter-making. For Men and Women, bona fide workers on a farm. On the 3rd day of the Show. [20 entries].*

Equal I. (£3 10s.)—MISS K. DAVIES.

Equal I. (£3 10s.)—MISS L. HOSKING.

III. (£1 10s.)—MISS P. E. JACKSON.

IV. (£1.)—MISS E. WATERS.

R.—MISS F. M. PRISK.

V.H.C.—MISS R. E. MITCHELL.—MISS E. PARRY.

H.C.—MISS F. ECKLEY.—MISS J. M. RIDLER.

CLASS 252.—*Butter-making. For Students who had been through a course of instruction in Butter-making at any County Council School, and who had not previously won a first or second prize at one of the Society's Shows. On the 4th day of the Show. [20 entries].*

I. (£4.)—MISS F. ECKLEY.

II. (£3.)—MISS E. WATERS.

III. (£1 10s.)—MISS M. RUDGE.

IV. (£1.)—MISS F. SCOTT.

V.H.C.—MISS F. M. PRISK.

H.C.—MISS R. E. MITCHELL.

CLASS 253.—Butter-making. For Men and Women. On the 4th day of the Show. [20 entries].

Equal I. (£3 10s.)—MISS R. M. GWILLIM.

Equal I. (£3 10s.)—MISS E. WATERS.

III. (£1 10s.)—MISS E. M. MORTIMER.

IV. (£1.)—MISS E. M. PRICE.

R.—MISS R. E. MITCHELL.

V.H.C.—MISS E. PARRY.—MISS J. M. RIDLER.

CLASS 254.—Butter-making. For Winners of First and Second Prizes in the Butter-making Classes 249 to 253, or at any previous meeting of the Society. On the 5th day of the Show. [12 entries].

I. (Gold Medal.)—MISS E. M. MORTIMER.

II. (Silver Medal.)—MISS P. E. JACKSON

III. (Bronze Medal.)—MISS K. DAVIES.

R.—MISS E. M. PRICE.

MILKING.

CLASS 255.—For Men, 16 years of age and over. [7 entries].

I. (£2.)—F. COMLEY.

II. (£1.)—R. PRENTICE.

III. (15s.)—C. H. BENNETT.

CLASS 256.—Milking. For Women, 16 years of age and over. [5 entries].

I. (£2.)—MISS G. E. HICKS.

II. (£1.)—MISS M. R. PUGH

R.—MISS M. G. PASCOE.

CLASS 257.—Milking. For Boys and Girls under 16 years of age. [1 entry].

I. (£1 10s.)—T. DUNN.

SHOEING.

CLASS 258.—For Cart Horse Shoeing by Smiths. On the 2nd day of the Show. [17 entries].

I. (£4.)—H. B. WELLAND.

II. (£3.)—J. HILL, A.F.C.L.

III. (£2.)—J. H. BAKER, jun., A.F.C.L.

IV. (£1.)—C. HAYES.

R.—H. W. BURDEN.

H.C.—C. S. DAVEY, A.F.C.L.—G. ENGLAND.—F. PARKIN, R.S.S.

SPECIAL LOCAL PRIZES.

(GIVEN BY THE SOMERSET COUNTY COUNCIL).

Best Competitors in Class 258, resident in Somerset.

I. (23.)—H. B. WELLAND.

II. (22.)—C. HAYES.

R.—H. W. BURDEN.

CLASS 259. *For Nag Horse Shoeing by Smiths. On the 3rd day of the Show. [17 entries].*

I. (24.)—H. BRISTER.

II. (23.)—H. W. BURDEN.

III. (22.)—J. H. BAKER, jun., A.F.C.L.

IV. (21.)—H. B. WELLAND.

R.—G. ENGLAND.

V.H.C.—J. TOMLINSON, A.F.C.L.

H.C.—J. HILL, A.F.C.L.

SPECIAL LOCAL PRIZES.

(GIVEN BY THE SOMERSET COUNTY COUNCIL).

Best Competitors in Class 259, resident in Somerset.

I. (23.)—H. BRISTER.

II. (22.)—H. W. BURDEN.

R.—H. B. WELLAND.

CLASS 260.—*For Hunter Shoeing by Smiths. On the 4th day of the Show. [12 entries].*

I. (24.)—J. H. BAKER, jun., A.F.C.L.

II. (23.)—H. B. WELLAND.

III. (22.)—H. KERSLAKE.

IV. (21.)—F. PARKIN, R.S.S.

R.—H. W. BURDEN.

H.C.—O. HIGGINS.—J. HILL, A.F.C.L.—J. TOMLINSON, A.F.C.L.

SPECIAL LOCAL PRIZES.

(GIVEN BY THE SOMERSET COUNTY COUNCIL).

Best Competitors in Class 260, resident in Somerset.

I. (23.)—H. B. WELLAND.

II. (22.)—H. KERSLAKE.

R.—H. W. BURDEN.

CLASS 261.—*For Shoe Making or Turning by Smiths, the patterns and description of the Shoes to be supplied by the Judge. On the 5th day of the Show.* [6 entries].

I. (£4.)—J. HILL, A.F.C.L.

II. (£3.)—H. W. BURDEN.

III. (£1.)—J. H. BAKER, jun., A.F.C.L.

IV. (10s.)—J. TOMLINSON, A.F.C.L.

SMALL HOLDINGS.

CLASS 1.—*Small Holding of over 15 acres.* [18 entries].

I. (£15.)—S. G. NASH, Fidoak Farm, Bishop's Hull, near Taunton.

II. (£10.)—R. H. SHIRE, Down's Holding, Donyatt, Ilminster.

III. (£5.)—E. H. T. VINCENT, Thrupe Farm, Masbury, near Wells.

IV. (£3.)—H. ROSSITER, Pickney, Kingston, Taunton.

B. and H.C.—H. G. MITCHELL, Lea Farm, Ilminster, Somerset.

H.C.—J. W. S. WHITE, Hillside Farm, Bower Hinton, Martock.

Special (£3.)—S. KIMBER, Henstridge, Somerset. (For general excellence of Stock and condition of land.)

CLASS 2.—*Small Holding of over 2 acres and not more than 15 acres.* [5 entries].

I. (£10.)—E. A. WILKINS, Fideoak Cottages, Bishop's Hull, Taunton.

II. (£7.)—T. GILLINGHAM, Court Farm, Seavington Somerset.

III. (£3.)—A. R. TOBIAS, 3, Small Holding, Staplegrove, Taunton.

B.—W. J. MILLER, Post Office, Locking, Weston-super-Mare.

POULTRY.

(UNDER POULTRY CLUB RULES).

(The Birds in Classes 1 to 48 must have been hatched previous to January 1st, 1924).

CLASS 1.—ANY TWO PURE BREEDS, BEST MATED TO CROSS FOR PRODUCING TABLE POULTRY—COCK AND THREE HENS, BRED IN 1922 OR 1923 (THE PROPERTY OF ONE EXHIBITOR. [6 entries.]

I. \$3.)—J. H. BAKER & SONS.

II. \$2.)—CORNISH BROS., *Indian Game and Speckled Sussex*.

III. (\$1.)—J. H. BAKER & SONS.

R.—MRS. UNDERDOWN, *Silver Dorking and Indian Game*.

H.C.—LADY FITZGERALD, *Indian Game and Broun Sussex*.

CLASS 2.—COCHIN OR BRAHMA, COCK. [3 entries].

I. (\$1.)—J. C. SHUFFREY, *Cochin*.

II. (15s.)—R. M. THOMAS, *Brahma*.

R.—Ditto.

CLASS 3.—COCHIN OR BRAHMA, HEN. [4 entries].

I. \$1.)—R. M. THOMAS, *Brahma*.

II. (15s.)—R. P. WHEADON, *Brahma*.

R.—R. P. WHEADON, *Brahma*.

V.H.C.—R. M. THOMAS, *Brahma*.

CLASS 4.—PLYMOUTH ROCK (BARRED), COCK. [8 entries].

I. (\$1.)—T. LEYSON.

II. (15s.)—G. W. ANSTEY.

III. (10s.)—W. E. DAINTON.

R.—T. SKINNER.

V.H.C.—W. J. CAMP.

H.C.—M. JONES.—H. LUKE.—J. SKINNER.

CLASS 5.—PLYMOUTH ROCK (BARRED), HEN. [7 entries].

I. (\$1.)—H. LUKE.

II. (15s.)—T. SKINNER.

III. (10s.)—T. LEYSON.

R.—W. J. CAMP.

V.H.C.—G. W. ANSTEY.

H.C.—M. JONES.

CLASS 6.—PLYMOUTH ROCK (ANY OTHER VARIETY), COCK. [4 Entries].

I. (£1.)—MAJOR J. A. MORRISON D.S.O.

II. (15s.)—T. NASH.

R.—H. J. SCREECH

CLASS 7.—PLYMOUTH ROCK (ANY OTHER VARIETY), HEN. [3 entries].

I. (£1.)—H. LUKE, *Black*.

II. (15s.)—MAJOR J. A. MORRISON, D.S.O.

R.—H. LUKE.

CLASS 8 —ORPINGTON (BLACK), COCK. [6 entries].

I. (£1.)—W. BALMENT.

II. (15s.)—T. C. PINNIGER.

III. (10s.)—T. ROUTIN.

R.—J. HARRINGTON.

V.H.C.—J. BARNES.

H.C.—O. LAVIS.

CLASS 9.—ORPINGTON (BLACK), HEN. [6 entries].

I. (£1.)—S. R. HOOPER.

II. (15s.)—W. BALMENT.

III. (10s.)—T. C. PINNIGER.

R.—J. BARNES.

V.H.C.—O. LAVIS.—MISS SHUFFREY.

CLASS 10.—ORPINGTON (ANY OTHER VARIETY), COCK. [4 entries].

I. (£1.)—MAJOR J. A. MORRISON, D.S.O.

II. (15s.)—LADY FITZGERALD.

R.—R. B. PRICE.

H.C.—G. J. A. WILKINSON.

CLASS 11.—ORPINGTON (ANY OTHER VARIETY), HEN. [6 entries].

I. (£1.)—LADY FITZGERALD.

II. (15s.)—MAJOR J. A. MORRISON, D.S.O.

III. (10s.)—MISS M. K. NAPIER.

R.—R. B. PRICE.

V.H.C.—G. J. A. WILKINSON.

H.C.—G. J. A. WILKINSON.

CLASS 12.—MINORCA, COCK. [9 entries].

I. (£1.)—D. JONES.

II. (15s.)—J. SKINNER.

III. (10s.)—R. P. WHEADON.

R.—G. CLEAVES.

V.H.C.—FURLAND BROS.—MISS P. MARSHALL.—J. SKINNER.

CLASS 13.—MINORCA, HEN. [12 entries].

I. (£1.)—BENNETT & MADDOCKS.

II. (15s.)—GOODMAN BROS.

III. (10s.)—FURLAND BROS.

R.—S. SHEPHERD.

V.H.C.—S. EVIS.—FURLAND BROS.—GOODMAN BROS.

H.C.—G. CLEAVES.—S. EVIS.—W. NEALE.

CLASS 14.—RHODE ISLAND RED, COCK. [14 entries].

I. (£1.)—T. JONES.

II. (15s.)—J. H. BAKER & SON.

III. (10s.)—R. EDWARDS.

R.—MRS. BOADEN.

**V.H.C.—J. BALMENT & SONS.—E. F. BENJAMIN.—G. H. COOK.—
G. H. MUZZLEWHITE.—A. T. ORGAN.—MRS. UNDERDOWN.**

H.C.—MISS M. K. NAPIER.—REV. AND MRS. GERVAIS NELSON.

CLASS 15.—RHODE ISLAND RED, HEN. [11 entries].

I. (£1.)—J. H. BAKER & SON.

II. (15s.)—G. H. MUZZLEWHITE.

III. (10s.)—B. L. BOSANQUET.

R.—H. J. GODDARD.

**V.H.C.—MISS M. K. NAPIER.—REV. AND MRS. GERVAISE NELSON.
—MRS. UNDERDOWN.**

**H.C.—A. F. BENJAMIN.—MRS. BOADEN.—MISS M. K. NAPIER.—
I. H. RADCLIFFE.**

CLASS 16.—SUSSEX (LIGHT), COCK. [11 entries].

I. (£1.)—R. E. BRIDDON.

II. (15s.)—MRS. H. KENT.

III. (10s.)—PARK HOUSE POULTRY FARM (LD.)

R.—R. P. PERCIVAL.

**V.H.C.—CAPT. A. D. KANGMAN M.P.—LINDLEY & ROGERS.—W. G.
SPARKES.**

H.C.—J. H. BAKER & SON.—W. G. SPARKES.

Prizes awarded for Poultry.

CLASS 17.—SUSSEX (LIGHT), HEN. [10 entries].

I. (£1.)—LINDLEY & ROGERS.

II. (15s.)—J. H. BAKER & SON.

III. (10s.)—R. P. PERCIVAL.

R.—MAJOR J. A. MORRISON, D.S.O.

V.H.C.—A. BRICE.—CAPT. A. D. KANGMAN, M.P.—MRS. UNDERDOWN.

H.C.—MRS. M. K. COLDWELL.—MRS. H. KENT.

CLASS 18.—SUSSEX (ANY OTHER VARIETY), COCK. [5 entries].

I. (£1.)—MAJOR J. A. MORRISON, D.S.O.

II. (15s.)—E. G. RYALL.

R.—W. SNELL.

V.H.C.—CAPT. A. D. KANGMAN, M.P.—DR. J. E. SHAW.

CLASS 19.—SUSSEX (ANY OTHER VARIETY), HEN. [6 entries].

I. (£1.)—MAJOR J. A. MORRISON, D.S.O.

II. (15s.)—E. G. RYALL.

III. (10s.)—W. SNELL.

R.—MAJOR W. M. J. MARTIN.

CLASS 20.—DORKING (ANY VARIETY), COCK. [4 entries].

I. (£1.)—A. J. MAJOR.

II. (15s.)—A. J. MAJOR.

R.—R. HALLETT, *Silver Grey*.V.H.C.—H. PICKFORD, *Silver*.

CLASS 21.—DORKING (ANY VARIETY), HEN. [4 entries].

I. (£1.)—A. J. MAJOR.

II. (15s.)—A. J. MAJOR.

R.—H. PICKFORD, *Silver*.V.H.C.—R. HALLETT, *Silver Grey*.

CLASS 22.—LANGSHAN, COCK OR HEN. [5 entries].

I. (£1.)—H. R. JONES.

II. (15s.)—LINDLEY & ROGERS.

R.—MISS A. H. GORDON BARRETT.

V.H.C.—MRS. W. K. FLOWER.—PARK HOUSE POULTRY FARM (LD.).

CLASS 23.—WYANDOTTE (WHITE), COCK. [7 entries].

I. (£1.)—PARK HOUSE POULTRY FARM (LD.).

II. (15s.)—W. H. DAY & SON.

III. (10s.)—MISS P. MARSHALL.

R.—F. W. MOOR.

H.C.—W. G. ROGERS.

CLASS 24.—WYANDOTTE (WHITE), HEN. [4 entries].

I. (£1.)—HEATHLANDS POULTRY FARM.

III. (10s.)—MISS M. SWORD.

CLASS 25.—WYANDOTTE (COLUMBIAN), COCK. [2 entries].

I. (£1.)—H. HUNT.

R.—R. MATTERFACE.

CLASS 26.—WYANDOTTE (COLUMBIAN), HEN—FIRST PRIZE, £1—
SECOND, 15s.—THIRD, 10s.

[No ENTRY].

CLASS 27.—WYANDOTTE (ANY OTHER VARIETY), COCK. [8 entries.]

I. (£1.)—W. CANN, *Black*.

II. (15s.)—A. HOLDEN, *Laced*.

III. (10s.)—J. MELLOR.

R.—ROGERS BROS.

V.H.C.—N. H. REED.

H.C.—J. HOW, *Partridge*.

CLASS 28.—WYANDOTTE (ANY OTHER VARIETY), HEN. [4 entries].

I. (£1.)—ROGERS BROS.

II. (15s.)—A. W. BROWN.

R.—T. LEYSON, *Silver Laced*.

H.C.—H. BROOM.

CLASS 29.—LEGHORN (WHITE), COCK. [2 entries].

II. (15s.)—A. H. STANBURY.

CLASS 30.—LEGHORN (WHITE), HEN. [5 entries].

I. (£1.)—MAJOR W. DOUGALL.

II. (15s.)—MRS. UNDERDOWN.

R.—W. J. THOMAS.

V.H.C.—T. REES.

H.C.—A. H. STANBURY.

CLASS 31.—LEGHORN (ANY OTHER COLOUR), COCK. [8 entries].

I. (£1.)—E. LL. SIMON.

II. (15s.)—E. LL. SIMON.

III. (10s.)—MRS. W. CARNELL, *Brown*.

R.—A. H. STANBURY, *Brown*.

V.H.C.—MRS. H. KENT, *Black*.

H.C.—MRS. H. E. WARREN, *Brown*.

CLASS 32.—LEGHORN (ANY OTHER COLOUR), HEN. [5 entries].

I. (£1.)—R. HIGGS, *Silver Duckwing*.

II. (15s.)—W. G. ROGERS, *Black*.

R.—MRS. H. KENT, *Black*.

H.C.—J. DOLBEAR, jun., *Black*.

CLASS 33.—CAMPINE, COCK. [6 entries].

I. (£1.)—E. W. CHAPPELL.

II. (15s.)—W. J. WADEY.

III. (10s.)—A. G. LEWIS.

CLASS 34.—CAMPINE, HEN. [7 entries].

I. (£1.)—L. TURNER.

II. (15s.)—MAJOR J. A. MORRISON, D.S.O

III. (10s.)—J. S. APPLETON.

R.—L. TURNER.

V.H.C.—L. TURNER.

CLASS 35.—HAMBURG (ANY VARIETY), COCK. [3 entries].

I. (£1.)—H. FORTUNE.

III. (10s.)—G. HARRIS.

CLASS 36.—HAMBURG (ANY VARIETY), HEN. [5 entries].

I. (£1.)—W. SNELL.

II. (15s.)—W. H. AVERY.

R.—H. FORTUNE.

V.H.C.—W. SNELL.—R. W. WHITAKER.

CLASS 37.—OLD ENGLISH GAME (BLACK RED), COCK. [9 entries].

I. (£1.)—F. G. BIGG & SON.

II. (15s.)—J. H. BAKER & SON.

III. (10s.)—HEARN BROS.

R.—H. DUNSTAN.

H.C.—E. J. BROWN.

CLASS 38.—OLD ENGLISH GAME (BLACK RED), HEN. [5 entries].

I. (£1.)—J. H. BAKER & SON.

II. (15s.)—HEARN BROS.

R.—W. SQUIRES.

H.C.—F. G. BIGG & SON.

CLASS 39.—OLD ENGLISH GAME (ANY OTHER COLOUR), COCK
[10 entries].

I. (£1.)—MAJOR J. A. MORRISON, D.S.O.

II. (15s.)—G. MASON.

III. (10s.)—J. GRAVES.

R.—HEARN BROS.

V.H.C.—W. AGGETT, *Duckwing*.—T. HUGHES.

H.C.—J. GRAVES.—W. SQUIRES.

CLASS 40.—OLD ENGLISH GAME (ANY OTHER COLOUR), HEN.
[6 entries].

I. (£1.)—MAJOR J. A. MORRISON, D.S.O.

II. (15s.)—J. H. BAKER & SON.

III. (10s.)—W. SQUIRES.

CLASS 41.—INDIAN GAME, COCK. [11 entries].

I. (£1.)—J. H. BAKER & SON.

II. (15s.)—W. BRENT & SON.

III. (10s.)—N. H. REED.

R.—N. HARRIS.

V.H.C.—J. H. BAKER & SON.—T. W. HIGGINS.

H.C.—W. J. CAMP.—S. R. HOOPER.

CLASS 42.—INDIAN GAME, HEN. [9 entries].

I. (£1.)—S. R. HOOPER.

II. (15s.)—W. BRENT & SON.

III. (10s.)—W. J. CAMP.

R.—J. EVANS.

V.H.C.—A. BRICE.—W. G. POLLEY.

H.C.—A. DUNN.

CLASS 43.—FRENCH (INCLUDING FAVEROLLES), COCK. [3 entries].

I. (£1.)—G. HENWOOD.

R.—J. SKINNER, *Houdan*.

Prizes awarded for Poultry.

CLASS 44.—FRENCH (INCLUDING FAVEROLLES), HEN. [5 entries].

I. (£1.)—R. H. J. PETERS, *Houdan*.

II. (15s.)—R. M. THOMAS, *Houdan*.

R.—G. HENWOOD.

V.H.C.—J. SKINNER, *Houdan*.

CLASS 45.—ANCONA, COCK. [2 entries].

I. (£1.)—J. G. PEDLER.

R.—A. T. WEATHERLEY.

CLASS 46.—ANCONA, HEN. [12 entries].

I. (£1.)—MRS W. K. FLOWER.

II. (15s.)—GARNET.

III. (10s.)—J. H. NORMAN.

R.—J. H. NORMAN.

V.H.C.—GARNET.—A. T. WEATHERLY.

H.C.—J. H. NORMAN.

CLASS 47.—ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED (EXCLUDING BANTAMS), COCK. [12 entries].

I. (£1.)—N. HARRIS, *Jubilee Indian Game*.

II. (15s.)—J. C. HUXTABLE, *Malay*

III. (10s.)—J. H. BAKER & SON.

R.—MISS A. H. GORDON BARRETT, *White Silkie*.

V.H.C.—MRS. A. HARRISON *Black Sumatra Game*.—H. HUNT, *Jubilee Indian*.

H.C.—H. PICKFORD, *Australorp*.—J. SKINNER, *Andalusian*.

W. G. BRENT, *Jubilee Indian Game*.

CLASS 48.—ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED (EXCLUDING BANTAMS), HEN. [11 entries].

I. (£1.)—J. H. BAKER & SON.

II. (15s.)—H. HUNT, *Jubilee Indian*.

III. (10s.)—J. C. HUXTABLE, *Malay*.

R.—J. SKINNER, *Andalusian*.

V.H.C.—W. SQUIRES, *Malay*.

H.C.—A. BARNES-LAWRENCE.—MISS A. H. GORDON BARRETT, *Duckwing Yokohama*.—R. J. RANDALL, *Andalusian*.

SELLING CLASSES.

CLASS 49.—ANY DISTINCT BREED, COCK OR COCKEREL (PRICE NOT TO EXCEED £1 IS.). [10 entries].

I. (£1.)—J. H. BAKER & SON.

II. (15s.)—LINDLEY & ROGERS, *Croad Langshan*.

III. (10s.)—R. W. WHITAKER, *Wyandotte*.

R.—J. HARRINGTON, *Black Orpington*.

V.H.C.—E. W. CHAPPELL, *Old English Game*.—J. EVANS, *Buff Rock*.

—J. H. NORMAN, *White Wyandotte*.—J. H. NORMAN, *Old English Game*.

CLASS 50.—ANY DISTINCT BREED, HEN OR PULLET (PRICE NOT TO EXCEED £1 IS.). [8 entries].

I. (£1.)—GOODMAN BROS., *Minorca*.

II. (15s.)—MRS. BOADEN, *Rhod. Island Red*.

III. (10s.)—H. E. MAY, *White Wyandotte*.

R.—H. BROOM, *Black Minorca*.

V.H.C.—J. H. BAKER & SON.—BENNETT & MADDOCKS, *Minorca*.—LINDLEY & ROGERS, *Indian Game*.—R. W. WHITAKER, *Hamburg*.

CHICKENS OF 1924.

CLASS 51.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX OR DORKING, COCKEREL. [9 entries].

I. (£1.)—A. J. MAJOR, *Dorking*, hatched January 4.

II. (15s.)—J. HARRINGTON, *Black Orpington*, hatched January 4.

III. (10s.)—MAJOR J. A. MORRISON, D.S.O., *Sussex*, hatched January 3.

R.—MRS. W. K. FLOWER, *Langshan*, hatched January 21.

V.H.C.—MRS. M. K. COLDWELL, *Light Sussex*, hatched January 14.—MRS. H. KENT, *Light Sussex*, hatched January 7.—PARK HOUSE POULTRY FARM (LD.), *Light Sussex*, hatched January 15.

H.C.—G. T. PARKER, *Light Sussex*, hatched February 16.

CLASS 52.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX OR DORKING, PULLET. [11 entries].

I. (£1.)—W. J. CAMP, *Plymouth Rock*, hatched February 7.

II. (15s.)—MAJOR J. A. MORRISON, D.S.O., *Sussex*, hatched January 3.

III. (10s.)—A. J. MAJOR, *Dorking*, hatched January 4.

R.—MRS. W. K. FLOWER, *Langshan*, hatched January 21.

V.H.C.—MRS. M. K. COLDWELL, *Light Sussex*, hatched January 14.—J. FAIRALL, *Light Sussex*, hatched January 1.—PARK HOUSE POULTRY FARM (LD.), *Light Sussex*, hatched January 15.—MRS. W. A. REEVES, *Buff Plymouth Rock*, hatched January 28.

H.C.—G. T. PARKER, *Light Sussex*, hatched January 22.

CLASS 53.—MINORCA, WYANDOTTE, LEGHORN, CAMPINE, HAMBURG, FAVEROLLES OR FRENCH, COCKEREL. [7 entries]

I. (£1.)—PARK HOUSE POULTRY FARM (LD.), *White Wyandotte*, hatched January 15.

II. (15s.)—HEATHLANDS POULTRY FARM, *White Wyandotte*, hatched January 19,

III. (10s.)—MISS P. MARSHALL, *White Wyandotte*, hatched January 22.

R.—MISS P. MARSHALL, *Silver Campine*, hatched January 22.

CLASS 54.—MINORCA, WYANDOTTE, LEGHORN, CAMPINE, HAMBURG, FAVEROLLES OR FRENCH, PULLET. [4 entries].

I. (£1.)—PARK HOUSE POULTRY FARM (LD.), *White Wyandotte*, hatched January 15.

II. (15s.)—V. SPURWAY, *White Wyandotte*, hatched January 2.

R.—J. PETTICAN, *Minorca*, hatched March 3.

CLASS 55.—GAME, MALAY, OR ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED, COCKEREL. [7 entries].

I. (£1.)—J. H. BAKER & SON, *Indian Game*, hatched January 3.

II. (15s.)—W. BRENT & SON, *Indian Game*, hatched January 18.

III. (10s.)—W. J. CAMP, *Indian Game*, hatched January 30.

V.H.C.—S. R. HOOPER, *Indian Game*, hatched January 2.

H.C.—C. H. BALMENT, *Game*, hatched January 4.—E. G. RYALL.

CLASS 56.—GAME, MALAY, OR ANY OTHER DISTINCT BREED NOT PREVIOUSLY MENTIONED, PULLET. [5 entries].

I. (£1.)—H. BRENT & SON, *Indian Game*, hatched January 18.

II. (15s.)—J. H. BAKER & SON, *Indian Game*, hatched January 3.

R.—REV. R. L. COLLINS, *Indian Game*, hatched January 2.

H.C.—R. S. HOOPER, *Indian Game*, hatched January 2.

LIVE TABLE POULTRY.

CLASS 57.—PAIR OF COCKERELS OF ANY PURE BREED, HATCHED IN 1924. [4 entries].

I. (£1.)—J. H. BAKER & SON, *Indian Game*, hatched January 3.

II. (15s.)—MAJOR J. A. MORRISON, D.S.O., hatched January 3.

R.—C. P. L. FIRTH, *Light Sussex*, hatched February 24.

H.C.—A. J. MAJOR, *Dorkings*, hatched January 6.

CLASS 58.—PAIR OF PULLETS OF ANY PURE BREED, HATCHED IN 1924. [3 entries].

I. (21.)—J. H. BAKER & SON, *Indian Game*, hatched January 3.

II. (15s.)—MAJOR J. A. MORRISON, D.S.O., hatched January 3.

R.—A. J. MAJOR, *Dorkings*, hatched January 6.

CLASS 59.—PAIR OF CROSS-BRED COCKERELS, HATCHED IN 1924. [1 entry].

II. (15s.)—LADY FITZGERALD, *Indian Game-Brown Sussex*, hatched January 4.

CLASS 60.—PAIR OF CROSS-BRED PULLETS, HATCHED IN 1924. [1 entry].

II. (15s.)—LADY FITZGERALD, *Indian Game-Brown Sussex*, hatched January 4.

UTILITY POULTRY.

CLASS 61.—LIGHT BREED, COCK. [6 entries].

I. (21.)—MRS. E. A. INNES.

II. (15s.)—PARK HOUSE POULTRY FARM (LD.), *White Leghorn*.

III. (10s.)—C. P. L. FIRTH, *Brown Leghorn*.

R.—MISS M. D. PIERCE GROVE, *White Leghorn*.

V.H.C.—MISS M. D. PIERCE GROVE, *White Leghorn*.

H.C.—LT.-COL. R. S. WESTON, *La Bresse*.

CLASS 62.—LIGHT BREED, HEN. [7 entries].

I. (21.)—C. P. L. FIRTH, *Brown Leghorn*.

II. (15s.)—MRS. E. PAULET, *Black Leghorn*.

III. (10s.)—A. SPARKES, *White Leghorn*.

R.—PARK HOUSE POULTRY FARM, (LD.), *Black Minorca*.

V.H.C.—MRS. M. D. PIERCE GROVE, *White Leghorn*.—Ditto.

H.C.—A. W. BROWN, *Black Leghorn*.

CLASS 63.—HEAVY BREED, COCK. [12 entries].

I. (21.)—MRS. E. A. INNES, *Rhode Island White*.

II. (15s.)—PARK HOUSE POULTRY FARM, (LD.), *White Wyandotte*.

III. (10s.)—A. BRICE, *Plymouth Rock*.

R.—V. SPURWAY, *White Wyandotte*.

V.H.C.—J. H. BAKER & SON.—T. GILLINGHAM, *Rhode Island Red*.—MRS. M. D. PIERCE GROVE, *White Wyandotte*.—J. V. WORTHINGTON, *White Wyandotte*.

H.C.—MISS M. GOODE, *Light Sussex*.

CLASS 64.—HEAVY BREED, HEN. [13 entries].

I. (£1.)—MRS. E. A. INNES, *Rhode Island White*.

II. (15s.)—W. NORRIS, *Rhode Island Red*.

III. (10s.)—T. GILLINGHAM, *Rhode Island Red*.

R.—C. P. L. FIRTH, *Light Sussex*.

V.H.C.—G. W. ANSTEY, *Barred Plymouth Rock*.—J. H. BAKER & SON.—MAJOR R. C. B. LETHBRIDGE, *Rhode Island Red*.—MRS. M. D. PIERCE GROVE, *White Wyandotte*.

H.C.—PARK HOUSE POULTRY FARM (LD.).—*Light Sussex*.—MRS. E. PAULET, *Light Sussex*.—MRS. M. D. PIERCE GROVE, *White Wyandotte*.—J. V. WORTHINGTON, *White Wyandotte*.

SPECIAL PRIZES.

GIVEN BY THE POULTRY CLUB.

Bath and West and Southern Counties Cup (Value £10 10s.). For the best Bird in the Show, the property of a Member of the Poultry Club. The Cup to be won three times, not necessarily in succession by the same exhibitor before becoming his absolute property. **I.**—J. H. BAKER & SON.

A Silver Medal for the best Cock or Cockerel in the Poultry Classes, the property of a Member of the Poultry Club. **I.**—J. H. BAKER & SON.

A Silver Medal for the best Hen or Pullet in the Poultry Classes, the property of a Member of the Poultry Club. **I.**—S. R. HOOPER.

The Associated Society's Bronze Medal for the best Bird in the Show. (Winner need not be a Member of the Poultry Club, but must be a Member of the Bath and West and Southern Counties Society. **I.**—MAJOR J. A. MORRISON, D.S.O.

GIVEN BY MRS. CAVILL, WINPENNY FARM, KINGSTON, TAUNTON.

A Silver Medal for the best Bird in Class 61 or 62. **I.**—MRS. E. A. INNES.

A Silver Medal for the best Bird in Class 63 or 64. **I.**—MRS. E. A. INNES, *Rhode Island White*.

DUCKS, GEESSE AND TURKEYS.

CLASS 65.—DRAKE OR DUCK (AYLESBURY). [3 entries].

I. (£1.)—G. B. BURROUGH.

II. (15s.)—G. B. BURROUGH.

R.—ABBOT BROS.

CLASS 66.—DRAKE OR DUCK (ROUEN). [5 entries].

I. (£1.)—ABBOT BROS.

II. (15s.)—MAJOR J. A. MORRISON, D.S.O.

R.—W. G. BRENT.

V.H.C.—S. R. HOOPER.

CLASS 67.—DRAKE OR DUCK (INDIAN RUNNER). [6 entries].

I. (£1.)—W. G. BRENT.

II. (15s.)—MISS P. MARSHALL.

III. (10s.)—SMITH & UNDERWOOD.

R.—G. B. BURROUGH.

V.H.C.—SMITH & UNDERWOOD.

CLASS 68.—DRAKE OR DUCK (ANY OTHER VARIETY). [7 entries].

I. (£1.)—MISS E. WESTON, *Buff Orpington*.

II. (15s.)—CAPT. C. K. GREENWAY, *Magpie*.

III. (10s.)—MISS E. WESTON, *Buff Orpington*.

R.—MISS E. WESTON, *Buff Orpington*.

V.H.C.—CAPT. C. K. GREENWAY, *Magpie*.

H.C.—MISS E. WESTON, *Buff Orpington*.—LT.-COL. R. S. WESTON, *Buff Orpington*.

CLASS 68.—GANDER OR GOOSE. [7 entries].

I. (£1.)—G. B. BURROUGH.

II. (15s.)—MRS. UNDERDOWN.

III. (10s.)—ABBOT BROS.

R.—G. B. BURROUGH.

V.H.C.—MAJOR J. A. MORRISON, D.S.O.

H.C.—MRS. UNDERDOWN.

CLASS 70.—TURKEY, COCK OR HEN. [2 entries].

I. (£1.)—ABBOT BROS.

HONEY SECTION.

THE SOMERSET BEEKEEPERS' ASSOCIATION ANNUAL HONEY SHOW.

(The Prizes were given by the Somerset Beekeepers' Association).

SECTION I.

(Open only to Members of the Somerset Beekeepers' Association).

CLASS 1.—*Three 1lb. Sections of Comb Honey of any year.* [13 entries].

I. (*Silver Medal.*)—T. SPARKS.

II. (*Bronze Medal.*)—C. S. GAY.

III. (*Cert. of Merit.*)—MRS. WALLACE.

CLASS 2.—*Three 1lb. Jars of Extracted Light-coloured Honey of any year; granulated or otherwise.* [17 entries].

I. (*Silver Medal.*)—A. E. BOURNE.

II. (*Bronze Medal.*)—MISS E. L. RUSHTON.

III. (*Cert. of Merit.*)—DR. P. A. COLMER.

H.C.—W. C. EBDON.

CLASS 3.—*Three 1lb. Jars of Extracted Medium or Dark-coloured Honey of any year, granulated or otherwise.* [9 entries].

I. (15s.)—G. INGRAM, Spaxton.

II. (10s.)—W. L. COXALL.

III. (7s. 6d.)—J. SPILLER.

H.C.—W. V. TRAYLER.

SECTION II. Open Classes.

CLASS 4.—*Six Sections of Comb Honey of any year.* [16 entries].

I. (15s.)—G. EVANS.

II. (10s.)—W. M. ROBSON.

III. (7s. 6d.)—J. SALT.

H.C.—J. E. PINDER.

CLASS 5.—*Six 1lb. Jars of Extracted Light-coloured Honey of any year, granulated or otherwise.* [28 entries].

I. (15s.)—A. E. BOURNE.

II. (10s.)—A. E. BARNES.

III. (7s. 6d.)—J. SALT.

H.C.—A. D. BENNETT.—H. C. COX.

CLASS 6.—*Six 1lb. Jars of Extracted Medium or Dark-coloured Honey, granulated or otherwise.* [19 entries].

I. (15s.)—J. SALT.

II. (10s.)—A. WILLMOTT.

III. (7s. 6d.)—E. C. R. WHITE.

H.C.—E. BOWERS.

CLASS 7.—*Three 1lb. Jars of granulated Honey of any year.* [23 entries].

I. (10s.)—E. C. R. WHITE.

II. (7s. 6d.)—MRS. B. J. POND.

III. (5s.)—A. D. BENNETT.

H.C.—H. C. COX.—G. J. C. VINCENT.

CLASS 8.—*One Jar of Honey, not less than 1lb., any shape or colour.* [32 entries].

(The Exhibits in this Class became the property of the Association and were equally divided between the Taunton General Hospital and the Bridgwater General Hospital).

I. (12s. 6d.)—J. SALT.

II. (7s. 6d.)—J. SPILLER.

H.C.—DR. COLMER.—T. SPARKS.

CLASS 9.—*Two Shallow Frames of Comb Honey for Extracting, gathered in 1923 or 1924.* [17 entries].

I. (15s.)—E. H. GARRETT.

II. (10s.)—J. SALT.

III. (5s.)—E. C. R. WHITE.

CLASS 10.—*Best and most attractive display of Honey in any form, staged on space 3ft. by 3ft. Max. height 4ft. above table.* [1 entry].

I. (30s.)—E. C. R. WHITE.

CLASS 11.—*Exhibit of not less than 2lbs. of Beeswax in any form, produced by the Exhibitor's bees.* [13 entries].

I. (10s.)—E. C. R. WHITE.

II. (7s. 6d.)—G. DAVIS.

III. (5s.)—G. J. C. VINCENT.

H.C.—C. ROBINSON.—J. SPILLER.—J. SALT.

SECTION III.

(Open only to Members of the Western Division of the Somerset Beekeepers' Association). The Prizes in this Section were presented by Members of the Taunton Branch).

CLASS 12.—*Three Sections of Comb Honey of any year.* [9 entries].

I. (15s.)—T. SPARKS.

II. (10s.)—MISS D. HOSEGOOD.

III. (7s. 6d.)—MRS. WILLMOTT.

CLASS 13.—*Three 1lb. Jars of Extracted Honey of any year.* [8 entries].

I. (15s.)—W. H. RADMORE.

II. (10s.)—J. SPILLER.

III. (5s.)—T. SPARKS.

CLASS 14.—*Exhibit of not less than 1lb. of Beeswax in any form, produced by the Exhibitor's bees.* [3 entries].

I. (10s.)—DR. KILLICK.

II. (7s. 6d.)—J. SPILLER.

III. (5s.)—T. SPARKS.

SECTION IIIA. Open only to Members of the Dorset Beekeepers' Association).

CLASS 12a.—*Three Sections of Honey of any year.* [2 entries].

I. (20s.)—MISS A. B. FLOWER.

CLASS 13a.—*Three 1lb. Jars of Extracted Honey of any year.* [5 entries].

I. (20s.)—G. DAVIS.

II. (10s.)—E. A. HODGES.

III. (5s.)—MISS A. B. FLOWER.

H.C.—MRS. B. J. POND.

CLASS 14a.—*Exhibit of not less than 1lb. of Beeswax in any form, produced by the Exhibitor's bees.* [3 entries].

I. (10s.)—G. DAVIS.

II. (7s. 6d.)—C. T. SANCTUARY.

(The Prizes in this Section were presented by the Dorset Beekeepers' Association).

SECTION IV. Open Classes. Appliances.

CLASS 15.—*Observatory Hive with one, two or more Brood Combs.*
[3 entries].

I. (15s.)—H. L. SWORDEN.

II. (10s.)—MRS. WALLACE.

CLASS 16.—*Collection of Hives and Appliances, to include :—Two Frames Hives complete with arrangement for supering, 2 Section Racks fitted with Sections, 1 Extractor, 1 Stimulative Feeder, 1 Rapid Feeder, 1 Smoker, 1 Super Clearer, 1 Veil, 1 Swarm Box for Travelling, 1 Nucleus box for travelling, 1 Travelling Crate for Comb Honey and not more than 6 other useful articles.* [4 entries].

I. (Silver Medal.)—BURTT & SON.

II. (Bronze Medal.)—S. A. BRADBURY.

III. (Cert. of Merit.)—J. E. PINDER.

CLASS 17.—*Best and most complete Frame Hive for general use.*
[4 entries].

I. (15s.)—E. H. TAYLOR & CO.

II. (10s.)—T. SPARKS.

CLASS 18.—*Most complete and inexpensive Frame Hive for Cottagers.*
[4 entries].

I. (10s.)—T. SPARKS.

II. (7s. 6d.)—E. H. TAYLOR & CO.

H.C.—J. E. PINDER.

SECTION V. Special Prizes.

CLASS 19.—*Exhibit of an interesting nature connected with the Bee Industry not mentioned in the foregoing Classes, including prepared food for bees, or articles of food or general utility in which Honey or Beeswax is an ingredient.* [5 entries].

I. (10s.)—R. LITMAN.

II. (5s.)—MISS A. B. FLOWER.

III. (2s. 6d.)—J. E. PINDER.

CLASS 20.—*Any new Invention or Exhibit of a Scientific or Educational nature not included in the foregoing Classes.* [10 entries].

I. (15s.)—DR. KILLICK.

II. (7s. 6d.)—E. I. WALKER.

III. (5s.)—E. I. WALKER.

H.C.—REV. G. H. HEWISON.—J. E. PINDER.—E. C. R. WHITE.

SECTION VI.

CLASS 21.—*One complete Uxbridge Hive, presented by Mr. Robert Lee, of Uxbridge, was awarded the Exhibitor obtaining the most points in the Show under the following conditions: 1st prize to count 4 points; 2nd prize to count 3 points; 3rd prize to count 2 points; H.C. to count 1 point. In the case of a tie an additional point was awarded to the Competitor obtaining the higher number of awards. For the purpose of computing the points Classes 12, 13 and 14 were considered as alternative to Classes 1, 2 and 11 respectively.*

I.—T. SPARKS.

CLASS 22.—*A prize of One Guinea was offered for the best quality Honey in the Show exhibited by a Member of the Somerset Bee-keepers' Association.*

I —A. E. BOURNE.

BATH AND WEST AND SOUTHERN COUNTIES SOCIETY.

OBJECTS OF THE SOCIETY AND PRIVILEGES OF MEMBERSHIP.

ANNUAL EXHIBITIONS.

THE Society annually holds an Exhibition in some city or town in England or Wales. Each section of the Society's district is visited at intervals, so that most Members have an opportunity of seeing the Show in their own neighbourhood every few years. Prizes to a large amount are given for Horses, Cattle, Sheep, Pigs, Farm Produce, &c. Provision is also made for the exhibition of Agricultural Implements and Machinery, Seeds, Cattle Foods, Artificial Manures, and articles of general utility. A substantially built and completely equipped Working Dairy on a large scale is a special feature of these Exhibitions. Here explanatory demonstrations and comparative tests of implements and processes are carried on, with the assistance of well-known practical and scientific experts, and Butter-making Competitions are held. Among the features of the Annual Meeting are Shoeing, Milking and other Competitions, Poultry and Horticultural Shows, and Exhibitions illustrative of Bee-keeping, Home Industries, Manufactures, Nature Study and Forestry.

Membership entitles to free admission to the Annual Exhibition, and also to the Grand Stand overlooking the Horse and Cattle Ring, to the Reserved Seats in the Working Dairy, and to the use of the Members' Special Pavilion for Luncheons, Reading, Writing, &c.

Entries can be made by Members (elected on or before the last Tuesday in January preceding the Show, or who have paid two years subscription before the date of closing of entries), at about half the Fees payable by Non-Members.

THE JOURNAL.

All Members receive free of charge the Society's Journal, which is published annually bound in cloth. It has for its aim the dissemination of agricultural knowledge in a popular form, and, in addition to original articles by well-known agricultural authorities, it contains particulars of the Society's general operations, full reports of its experimental and research work, prize awards, financial statements, lists of Members, reviews of new books on agriculture, &c. (The price of the Journal to non-Members is 6s. 6d. post free.)

CHEMICAL AND OTHER FACILITIES.

The Society has a Consulting Chemist *from whom Members can obtain analyses and reports at reduced rates of charge.* An arrangement has also been made under which Members of the Society can obtain, free of charge, from the National Fruit and Cider Institute at Long Ashton, analyses of cider-apples and perry-pears, and, with a view to assisting farmers and others in dealing with insect and other pests which affect agriculture, horticulture, &c., the Council have availed themselves of an offer from the Board of Economic Biology of the University of Bristol to investigate the nature of any insect or other pest and report upon it free of charge.

EXPERIMENTS.

Experiments on crops are conducted at experimental stations in various parts of the Kingdom, and *Members are enabled to take part in these and to receive reports thereon.*

MANUFACTURES, NATURE STUDY, FORESTRY, &c.

One of the objects for which the Society was founded was the encouragement of Arts as well as Agriculture, and, to this end, exhibitions are held of Manufactures and of work representative of Arts and Handicrafts. Exhibitions are also held illustrating Nature Study, as a branch of Education; the Science of Forestry, &c.

TERMS OF MEMBERSHIP.

ANNUAL SUBSCRIPTIONS.

Governors, not less than	..	..	..	..	£2
Ordinary Members, not less than	..	..	..	..	£1
Tenant Farmers, the rateable value of whose holdings does					
not exceed £200 a-year, not less than					10s.

Governors, who are eligible for election as President or Vice-President, are entitled, in addition to the privileges already mentioned, to an extra Season Ticket for the Annual Exhibition and for the Grand Stand, &c. Governors subscribing more than £2 are entitled to a further Ticket for every additional £1 subscribed.

Members subscribing less than £1 are entitled to all the privileges of Membership except that of entering Stook at reduced fees, and their admission Ticket for the Annual Show is available for *one day only* instead of for the whole time of the Exhibition.

LIFE COMPOSITIONS.

Governors may compound for their Subscription for future years by payment, in advance, of £20; and Members by payment, in advance, of £10. Governors and Members who have subscribed for twenty years may become Life Members on payment of half these amounts.

Any person desirous of joining the Society can be proposed by a Member, or by the Secretary, 3, Pierrepont Street, Bath.

Telegraphic Address—"AGRICULTURE, BATH."

Telephone No. 610.

BATH AND WEST AND SOUTHERN COUNTIES SOCIETY.

GENERAL LAWS.

As revised in accordance with the Report of a Special Committee; which Report was received and adopted by the Annual General Meeting of Members, held on May 19, 1923.

COMPOSITION OF THE SOCIETY.

I. The Society shall consist of a President, Vice-Presidents, Trustees, Council, Treasurer, Secretary, and Members.

OBJECTS.

II. The Society shall have the following objects :—

- (a) To hold Exhibitions of breeding stock, agricultural implements, and such other articles connected with agriculture, horticulture, arts, manufactures or commerce, as may be determined upon by the Council.
- (b) To conduct practical and scientific investigations in agriculture and horticulture.
- (c) To promote technical education in agriculture and horticulture by providing means of systematic instruction.
- (d) To publish a Journal for circulation.

SUBSCRIPTIONS.

III. The Annual Subscription for Members shall be as follows — .

Governors (who are eligible for election as President or Vice-President), not less than	£2
Ordinary Members, not less than	£1
Tenant Farmers (the rateable value of whose holdings does not exceed £200 a year), not less than	10s.

IV. The payment of £20 in one sum shall constitute a Governor for life, and of £10 in one sum an Ordinary Member for life ; but any Governor who has subscribed not less than £2 annually for a period of twenty years may become a Life Governor on the further payment of £10 in one sum : and any Ordinary Member, who has subscribed not less than £1 annually for the same period may become a Life-Member on the further payment of £5 in one sum.

V. Subscriptions shall become due and be payable in advances on the 1st of January in each year or as soon as the Subscriber has been elected a Member. When the election takes place during the last quarter of the year the subscription payable on election will be considered as applying to the ensuing year.

VI. A Member shall be liable to pay his subscription for the current year unless he shall have given notice, in writing, to the Secretary before January 1st of his intention to withdraw.

GOVERNING BODY.

VII. The entire management of the Society—including the making of Bye-laws, election of Members, determining the Prizes to be awarded, appointing Committees, fixing the Places of Meetings and Exhibitions, appointing or removing the Treasurer, Secretary, and such other officers as may be required to carry on the business of the Society—shall be vested in the Council who shall report its proceedings at the Annual Meetings of the Society:

VIII. The Council shall consist of the Patron (if any), President, Vice-Presidents, Trustees, and Treasurer (who shall be *ex-officio* Members), and of sixty-six elected Members.

ELECTION OF PRESIDENT, VICE-PRESIDENTS, TRUSTEES AND COUNCIL.

IX. The election of a President for the year, of any additional Vice-Presidents or Trustees, and of the Members of Council representing the Divisions named in Law X., shall take place at the Annual Meeting of the Society, and they shall enter into office at the conclusion of the Exhibition during which such Annual Meeting has been held.

X. The sixty-six Members of the Council referred to in Laws VIII. and IX. shall consist of fifty-eight persons residing or representing property in the following Divisions, viz. :—

Twelve from the Counties of Devon and Cornwall, which shall be called the Western Division ;

Twenty-four from the Counties of Somerset, Dorset and Wilts, which shall be called the Central Division ;

Twelve from the Counties of Hants, Berks, Oxon, Bucks, Middlesex, Surrey, Sussex and Kent, which shall be called the Southern Division ; and

Ten from the Counties of Worcester, Gloucester, Hereford and Monmouth, and the Principality of Wales, which shall be called the North-Western Division.

The remaining eight shall be elected (irrespective of locality) from the general body of members, and shall form a Division which shall be called the " Without Reference to District " Division.

XI. One-half of the elected Members in each of the five Divisions named in Law X. shall retire annually by rotation, but shall be eligible for re-election.

XII. The Council shall have power to nominate a President, Vice-Presidents, Trustees, and Members of Council for the approval of the Annual Meeting, and to fill up such vacancies in their own body as are left after the Annual Meeting, or as may from time to time occur during the interval between the Annual Meetings.

XIII. Nominations to offices, election to which is vested in the whole body of Members, must reach the Secretary ten days before the meeting at which such vacancies are to be filled up.

MEETINGS.

XIV. The Annual Meeting of the Society shall take place during the holding of the annual Exhibition.

XV. Special General Meetings of the Society may be convened by the President on the written requisition of not less than three Members of Council ; and all Members shall have ten days' notice of the object for which they are called together,

XVI. No Member of less than three months' standing, or whose subscription is in arrear, shall be entitled to vote at a Meeting.

EXHIBITIONS.

XVII. The Annual Exhibitions of the Society shall be held in different Cities or Towns in successive years.

XVIII. All Exhibitors shall pay such fees as may be fixed by the Council. Members subscribing not less than £1 per annum, who have been elected previous to February 1st, and have paid the subscription for the current year, or if elected later, who pay a subscription for the previous year and the current subscription before the date of closing of entries, shall be entitled to exhibit at such reduction in these fees as the Council shall determine.

PRIZES.

XIX. All prizes offered at the cost of the Society shall be open for competition to the United Kingdom.

XX. No person intending to compete for any prize offered at the annual Exhibition shall be eligible to act as a judge or to have any voice in the selection of judges to award the premiums in the department in which he exhibits.

XXI. If it be proved to the satisfaction of the Council that any person has attempted to gain a prize in this, or in any other society, by a false certificate or by a misrepresentation of any kind, such person shall thereupon be, for the future excluded from exhibiting in this Society.

JOURNAL.

XXII. The Proceedings of the Society, Awards of Prizes, Financial Statements and Lists of Officers, Governors, and Members, shall be printed annually in the Society's *Journal*, and every Governor and Member, not in arrear with his subscription, shall be entitled to receive one copy, free of expense, and there shall be an additional number printed for sale.

POLITICS.

XXIII.—No motion or question of a political tendency shall be introduced at any meeting of the Society, otherwise than with the consent of two-thirds of the members present at any meeting, and then only after 14 days notice in writing.

ALTERATIONS IN LAWS.

XXIV. No new General Law shall be made or existing one altered, added to or rescinded, except at an Annual or Special General Meeting, and then only provided that a statement of particulars, in writing, shall have been sent to the Secretary at least twenty-one days previous to the Meeting at which the question is to be considered.

LIST OF OFFICERS,

1924-25.

PATRON.

HIS MOST GRACIOUS MAJESTY THE KING.

PRESIDENT.

COL. F. S. W. CORNWALLIS, C.B.E., D.L., Linton Park, Maidstone.

TRUSTEES.

*BATH, THE MARQUIS OF, K.G., Longleat, Warminster.

SHELLEY, SIR J., BART., Shobrooke Park, Crediton.

NAPIER, H. B., Ashton Court Estate Office, Long Ashton, Bristol.

VICE-PRESIDENTS.

ASHCROFT, W.	The Waldrons, Croydon
BADCOCK, H. J.	Broadlands, Taunton
*BATH, MARQUIS OF, K.G.	Longleat, Warminster
BENYON, J. HERBERT	Englefield House, Reading
*BLEDISLOE, LORD, K.B.E.	Lydney Park, Gloucester
BLYTHSWOOD, LORD	Penrice Castle, Reynoldston, S.O., Glam.
*BOLES, LT.-COL. SIR DENNIS F., BART, C.B.E., D.L.	Watts House, Taunton
*BUTE, MARQUIS OF	The Castle, Cardiff
*CLINTON, LORD	Heanton Satchville, Dolton, N.Devon
*COVENTRY, THE EARL OF	Croome Court, Worcester
CUNDALL, H. M., I.S.O., F.S.A.	4. Marchmont Gardens, Richmond Hill, Surrey
FALMOUTH, VISCOUNT	Tregothnan, Truro
HAMBLEDEN, VISCOUNT	Greenlands, Henley-on-Thames
HORHOUSE, RIGHT HON. H.	Hadspen House, Castle Cary
*LANSDOWNE, MARQUIS OF, K.G.	Bowood, Calne
*LLEWELYN, SIR J. T. D., BART.	Penllergaer, Swansea
MOUNT EDGCUMBE, THE EARL OF	Mount Edgcumbe, Devonport
NAPIER, H. B.	Long Ashton, Bristol
NEVILLE GREENVILLE, R.	Butleigh Court, Glastonbury

.. Those to whose names an asterisk (*) is prefixed have filled the office of President.

VICE-PRESIDENTS—continued.

NORTHUMBERLAND, DUKE OF	.	.	.	Albury Park, Guildford
POLTIMORE, LORD	.	.	.	Court Hall, North Molton, Devon
*RADNOR, THE EARL OF	.	.	.	Longford Castle, Salisbury
SHELLEY, SIR J., Bart.	.	.	.	Shobrooke Park, Crediton
SOMERVILLE, A. F.	.	.	.	Dinder House, Wells
STRACHIE, LORD	.	.	.	Sutton Court, Pensford, Somerset
TEMPLE, EARL	.	.	.	Newton St. Loe, Bristol
TUDWAY, C. C.	.	.	.	Milton Lodge, Wells
WYNFORD, LT.-COL. RT.-HON. LORD.				
D.S.O.	.	.	.	Wynford House, Maiden Newton, Dorset

THE LORD WARDEN OF THE STANNARIES.

**THE SECRETARY AND KEEPER OF THE RECORDS OF THE DUCHY OF
CORNWALL.**

THE RECEIVER-GENERAL OF THE DUCHY OF CORNWALL.

. Those to whose names an asterisk () is prefixed have filled the office of President.

MEMBERS OF COUNCIL.

EX-OFFICIO MEMBERS.

THE PATRON.
THE PRESIDENT.

THE VICE-PRESIDENTS.
THE TRUSTEES.
THE TREASURER.

ELECTED MEMBERS.

WESTERN DIVISION (DEVON AND CORNWALL). (12 Representatives.)

Elected in 1923.

Name.	Address.
BOSCAWEN, REV. A. T.	Ludgvan Rectory, Long Rock, R.S.O., Cornwall
CHICHESTER, MAJOR C. H.	Hall, Bishop's Tawton, Barnstaple
DAW, J. E.	4, Louisa Terrace, Exmouth
LOPES, SIR HENRY	Maristow, Roborough, Y. B., Bart.
MARTYN, G.	South Devon
MORLEY, EARL OF	Liskeard, Cornwall
	Salttram, Plympton, Devon

Elected in 1924.

Name.	Address.
BUCKINGHAM, REV. THE	Rectory, Doddish-PREB.
GIBBS, MAJOR A. H.	combeleigh, Exeter
	Pytts, Clyst St. George, Exeter
MOORE-STEVENS, COL.	Woodhayes, Whimble, R. A.
SHELLEY, J. F.	Devon
WILLIAMS, JOHN	Posbury House, Crediton
	Scorrier House, Scorrier, Cornwall

CENTRAL DIVISION (SOMERSET, DORSET, AND WILTS). (24 Representatives.)

FARWELL, Major E. W.	Hylton Estate Office, Kilmersdon, Bath
GORDON, G. H.	The Barn House, Sherborne, Dorset
HILL, MAJOR V. T.	Woodspring Priory, near Weston-super-Mare
HOARE, SIR H. H. A., Bart.	Stourhead, Zeals, S.O., Wilts
HURLE, J. C.	Kilve Court, Bridgwater
KNIGHT, S. J.	Buckingham Lodge, Keynsham, Bristol
POPHAM, H. L.	Hunstrete House, Pensford, Bristol
RAWLENCE, E. A.	St. Andrew's, Salisbury
RAWLENCE, G. N.	Salisbury
SEAW, COL. F. S. KENNEDY	Teffont Magna, Salisbury
WATSON, CAPT. THE	Cornistown, Milverton, Somerset
HON. T. H.	
WHITE, A. R., O.B.E.	Charnage, Mere, Wilts

BRATTON, SIR F. B.	Woodboro' House, Pease-down St. John, Bath
BRUFORD, R.	Nerolds, Taunton
OLIVE, CAPT. E. A. B.	South Brympton, Yeovil
FOX, R. A.	Yate House, Yate, Glos.
GIBSON, J. T.	Warren House, Wrington
HOBHOUSE, A. L.	Hadspan House, Castle Cary, Somerset
LIPSCOMB, G.	Claverton Lodge, Bathwick Hill, Bath
MILES, SIR C., Bart.	Manor House, Walton-in-Gordano, Clevedon.
NICHOLS, G.	Demerara House, Colston Avenue, Bristol
PAGE, MAJOR A. D.	Manor House, Wootton Fitzpaine, Charnmouth, Dorset
PEARCE, T. H.	Parsonage Farm, Long Ashton, Bristol
SANDERS, THE RIGHT	Bayford Lodge, Wincan-
HON. LIEUT. COL.	ton
SIR R.A., Bart., M.P.	

SOUTHERN DIVISION (HANTS, BERKS, OXON, BUCKS, MIDDLESEX, SURREY, SUSSEX AND KENT). (12 Representatives.)

COBB, H. M.	Higham, Rochester
CORNWALLIS, Col.	Linton Park, Maidstone
F.S.W., C.B.E., D.L.	
EMAY, J. H.	Iwerne Minster, Blandford
LLEWELLYN, CAPTAIN	
L. T. E.	Hackwood, Basingstoke
ORDE POWLETT HON.	Bolton Hall, Leyburn, N.A.
	Yorkshire
ALLSBERG, A.	Frenches, Mark Cross, Sussex

ACLAND, Rt. Hon. F.	93, Bedford Gardens, Dyke
	Camden Hill, London, W. 8
BATHURST, SIR F. H., Bart., D.S.O.	Somborne Park, Kings
FOLKESTONE, VISCT.	Longford Castle, Salisbury
JERVOISE, MAJOR	Herriard Park, Basingstoke
F. H. T.	
SUTTON, E. P. F.	Sidmouth Grange, Earley, Berks
THOMAS-STANFORD, C.	Preston Manor, Brighton

NORTH-WESTERN DIVISION (WORCESTERSHIRE, GLOUCESTERSHIRE, HEREFORDSHIRE, MONMOUTHSHIRE AND WALES). (10 Representatives.)

ACKERS, G. P.	Huntley Manor, Glos.
ALEXANDER, Hubert.	5, High Street, Cardiff
DRUMMOND, Col.	Cawdor Estate Office, Carmarthen
F. D. W., O.B.E.	
LEWIS, Col. H.	Green Meadow, nr. Cardiff
SWANSEA, LORD, D.S.O.	Glanogwr, Bridgend, Glam.
M.V.O.	

BEST, CAPT. W.	Vivod, Llangollen
MASTERS, A.	Kyneton, Thornbury, Gloucester
MASON, F. F.	Swansea
STORRAE, J. I.	Tredeggar Estate Office, Newport, Mon.

WITHOUT REFERENCE TO DISTRICT DIVISION. (8 Representatives.)

CAVE, E. C.	Pacombe, Sidford, Sidmouth, Devon
IMBERT-TERRY, F. B.	Blue Hayes, Broadlyst, Devon
KNOLLYS, C. R.	Richmond Lodge, Richmond Hall, Surrey
POWLETT, A. T.	Goodnestone Farm, Bruton, Somerset

BEST, MAJOR T. G.	East Carleton Manor, Norwich
GIBBS, COL. W. O.	Home Farm, Barrow Gurney

STANDING COMMITTEES, 1924-1925.

[The PRESIDENT is an *ex-officio* Member of all Committees.]**ALLOTMENT.***Chairman.*

BATH, MARQUIS OF, K.G.	BEST, CAPT. W.	SHELLEY, J. F.
BATHURST, SIR F. H., Bart., D.S.O.	FOLKESTONE, VISCOUNT MASON, F. F.	WYNFORD, LIEUT.-COL. LORD, D.S.O.
	NAPIER, H. B.	

CONTRACTS.*NAPIER, H. B., Chairman.*

ALLSEBROOK, A.	BEST, CAPT. W.	NEVILLE GRENVILLE, R.
BATH, MARQUIS OF, K.G.	DAW, J. E.	RAWLENCE, G. N.
BATHURST, SIR F. H., Bart., D.S.O.	MASON, F. F.	

DAIRY.*SOMERVILLE, A. F., Chairman.*

ASHOROFF, W.	KNIGHT, S. J.	STRACHIE, LORD
CLIVE, CAPTAIN E. A. B.	LLEWELLYN, CAPT. L. T. E.	TUDWAY, C. C.
GIBBS, MAJOR A. H.	NAPIER, H. B.	VOELCKER, DR., J. A., M.A.
GIBSON, J. T.	NEVILLE GRENVILLE, R.	WHITE, A. R., O.B.E.
HURLE, J. C.	RAWLENCE, G. N.	

DISQUALIFYING.

THE STEWARDS OF LIVE STOCK AND PRODUCE.

EXPERIMENTS AND EDUCATION.*LORD BLEDISLOE, K.B.E., Chairman.*

ACKERS, C. P.	HURLE, J. C.	RAWLENCE, E. A.
ALLSEBROOK, A.	ISMAY, J. H.	SOMERVILLE, A. F.
ASHCROFT, W.	LIPSCOMB, G.	SUTTON, E. P. F.
BENYON, J. H.	NAPIER, H. B.	VOELCKER, DR. J. A., M.A.
GIBSON, J. T.	NEVILLE GRENVILLE, R.	WALLACE CAPT. T. M.Sc., M.C.
HOBHOUSE, A. L.	PENBERTHY, PROF. J., F.R.C.V.S.	

(With power to add to their number.)

FINANCE.*NAPIER, H. B., Chairman.*

DAW, J. E.	GIBBS, MAJOR A. H.
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FORESTRY.*LIPSCOMB, G., Chairman.*

ACKERS, C. P.	DRUMMOND COL. F. D. W., C.B.E.	NAPIER, H. B.
BLEDISLOE, LORD, K.B.E.	HOARE, SIR H. H. A., Bart.	ORD POWLETT, HON. N.A.
CLINTON, LORD		

List of Officers, 1924-25.

IMPLEMENT REGULATIONS.

BATH, MARQUIS OF, K.G., *Chairman.*

BATHURST, SIR F. H., Bart., D.S.O.	MASON, F. F. MOORE-STEVENS, COL. R. A.	NAPIER, H. B. NEVILLE GRENVILLE, R.
BEST, CAPT. W.		
MARTYN, G.		

JOURNAL.

Chairman.

ACLAND, RT. HON. F. D.	BLDISLOE, LORD, K.B.E. HURLE, J. C.
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JUDGES' SELECTION.

WYNFORD, LIEUT.-COL. LORD, D.S.O., *Chairman.*

ALEXANDER, HUBERT	HOARE, SIR H. H. A., Bart.	NAPIER, H. B.
BATHURST, SIR F. H., Bart. D.S.O.	MASON, F. F. MOORE-STEVENS, COL. R. A.	SHAW, COL. F. S. KENNEDY SHELLEY J. F.
GORDON, G.		

RAILWAY ARRANGEMENTS AND ADVERTISEMENTS.

BATH, MARQUIS OF, K.G.	COVENTRY, EARL OF	MASON, F. F.
BLDISLOE, LORD, K.B.E.		

(With power to add to their number.)

SCIENCE AND ART.

BATH, MARQUIS OF, K.G., *Chairman.*

ACLAND, RT. HON., F. D.,	CUNDALL, H. M. (I.S.O., F.S.A.)	HOBHOUSE, RT. HON. H. LIPSCOMB, G.
BLDISLOE, LORD, K.B.E.	DAW, J. E. FARWELL, MAJOR E. W.	LLEWELYN, SIR J. T. D., Bart. NAPIER, H. B.

(With power to add to their number.)

SELECTION.

THE CHAIRMEN OF ALL OTHER COMMITTEES.

SHOW PLACE AND DATE.

CHAIRMAN OF THE ALLOTMENT, CONTRACTS, DAIRY, FINANCE, FORESTRY,
IMPLEMENT REGULATIONS, RAILWAY ARRANGEMENTS, SCIENCE AND ART,
AND STOCK PRIZE SHEET COMMITTEES.

(With power to add two Local Members to their number.)

STOCK PRIZE SHEET.

WYNFORD, LIEUT.-COL. LORD, D.S.O., *Chairman.*

ALEXANDER, HUBERT	GIBBS, MAJOR A. H.	MOORE-STEVENS, COL.
ALLSIBROOK, A.	HOARE, SIR H. H. A., Bart.	R. A.
BUCKINGHAM, REV. FRANK	LEWIS, COL. H.	SHAW, COL. F. S.
CHICHESTER MAJOR C. H.	MASON, F. F. MILES, LIEUT.-COL. SIR C., Bart.	KENNEDY SHELLEY, J. F. STORRAR, J. I. SUTTON, E. P. F. WHITE, A. R., O.B.E.

WORKS.

Chairman.

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BATHURST, SIR F. H., Bart. D.S.O.
BEST, CAPT. W.

MASON, F. F.
NAPIER, H. B.

Stewards.

Cattle, Sheep and Pigs.

MOORE-STEVENS, COL. R. A.
MILES, LIEUT.-COL. SIR C., Bart.
SHELLEY, J. F.

Cider.

FARWELL, MAJOR E. W.

Dairy.

SOMERVILLE, A. F.
GIBBS, MAJOR A. H.

Experiments.

ACKERS, C. P.

Finance.

NAPIER, H. B.
DAW, J. E. GIBBS, MAJOR A. H.

Forage.

Forestry.

LIPSCOMB, G.

Horses.

WYNFORD, LIEUT.-COL. LORD., D.S.O.
HOARE, SIR H. H. A., Bart.
ALEXANDER, HUBERT

Horticulture.

TUDWAY, C. C.

Music.

CUNDALL, H. M. (I.S.O., F.S.A.)

Poultry.

BRUFORD R.

Science and Art.

CUNDALL, H. M. (I.S.O., F.S.A.)

Shoeing.

MASON, F. F.

Yard.

BATH, MARQUIS OF, K.G.
BATHURST, SIR F. H., Bart.,
D.S.O.
BEST, CAPT. W.
FOLKESTONE, VISCOUNT

Society's Representatives on Governing Bodies and Committees.

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Dauntsey School Foundation—WHITE, A. R., O.B.E.

National Fruit and Cider Institute—NAPIER, H. B., ACKERS, C. P.

Sugar Beet Growers Society—ALEXANDER, HUBERT.

South Eastern Agricultural College, Wye—ASHCROFT, W.

Dairy Research Committee of University College, Reading—LATHAM, T.

Agricultural Education Committee of Wilts County Council—WHITE, A. R., O.B.E.

Permanent Officials.

Treasurer—LUTTRELL, C. M. F.

Secretary and Editor—STORE, F. H., O.B.E.

Assistant Secretary—SMITH, W. A.

Auditor.

GOODMAN, F. C. A. (*Chartered Accountant*)

Consulting Chemist.

VOMLOKER, DR. J. A. (M.A., F.I.C.)

Veterinary Inspector.

PENBERTHY, Prof. J. (F.R.C.V.S.)

Superintendent of Works.

AYRE, H. G.

Annual Exhibitions.

Year.	Place Visited.	Local Subscription.	Prizes.			Total Local Contribution.	President.	Admissions.		
			Local Committee.	Local Societies.	Local Residents.			On 2/6 Days.	On 1/- Days.	Total.
1853	Plymouth	£ 450	£ ..	£ ..	£ 450	Sir T. D. Acland, Bart.	..	..	..
1854	Bath	450	..	..	..	450	William Miles, M.P.	..	..	..
1855	Tiverton	450	..	..	..	450	Earl Fortescue	..	..	..
1856	Yeovil	450	..	..	..	450	C. A. Moody, M.P.	..	..	..
1857	Newton Abbot	700	..	..	..	700	Lord Courtenay	..	..	..
1858	Cardiff	800	..	..	..	800	Lord Courtenay	..	..	..
1859	Barnstaple	800	85	81	..	966	John Sillifant	..	..	..
1860	Dorchester	900	..	..	..	900	Lord Rivers	10,709	11,949	22,658
1861	Truro	900	..	..	..	900	J. W. Buller, M.P.	15,201	14,220	29,421
1862	Wells	900	..	..	..	900	Sir T. D. Acland, Bart.	10,578	4,775	15,353
1863	Exeter	900	..	..	..	900	Marquis of Bath	15,635	19,284	34,919
1864	Bristol	1000	106	50	..	1156	Earl Fortescue	22,377	65,678	88,055
1865	Hereford	900	358	..	..	1258	Lord Taunton	16,575	35,261	51,836
1866	Salisbury	900	57	..	..	957	(Earl of Portsmouth	7,288	18,737	26,025
1867	Salisbury	..	..	..	..	..	J. Tremayne	7,502	16,702	24,204
1868	Falmouth	900	..	..	..	900	Sir J. T. B. Duckworth, Bart.	11,393	19,495	30,888
1869	Southampton	900	132	..	18	1050	Earl of Carnarvon	15,340	41,290	56,630
1870	Taunton	900	..	..	..	900	Sir S. H. Northcote, Bart., C.B., M.P.	17,952	33,653	51,605
1871	Guildford	900	110	..	..	1010	Earl of Cork	10,656	23,406	34,062
1872	Dorchester	800	..	..	10	810	Duke of Marlborough, K.G.	12,791	21,517	34,308
1873	Plymouth	800	..	400	..	1200	Earl of Mount-Edgumbe	16,665	45,744	62,409
1874	Bristol	800	403	..	..	1203	Sir Massey Lopes, Bart., M.P.	37,329	72,791	110,120
1875	Croydon	800	245	..	..	1045	R. Benyon, M.P.	14,518	26,028	40,546
1876	Hereford	800	381	..	..	1181	Earl of Ducie	16,396	32,645	49,041
1877	Bath	800	215	..	..	1015	Marquis of Lansdowne	27,625	48,852	76,477
1878	Oxford	800	..	10	6	976	Earl of Jersey	12,414	26,985	39,409
1879	Exeter	800	..	..	10	810	Earl of Morley	14,634	40,533	55,167

ANNUAL EXHIBITIONS—continued.

Year.	Place Visited.	Local Subscription.	Prizes.			Total Local Contribution.	President.	Admissions.			
			Local Committee.	Local Societies.	Local Gentls.			On 5/- Day.	On 1/- Day.	On 2/6 Day.	Total.
1880	Worcester	£ 800	£ 254	£ ..	£ 1054	Earl of Coventry	..	..	8,415	37,675	46,090
1881	Tunbridge Wells	800	245	34	1079	Marquis of Abergavenny	..	..	13,368	33,236	46,604
1882	Cardiff	800	200	198	1215	Lord Tredegar	..	..	23,941	38,680	62,621
1883	Bridgwater	800	78	..	878	Lord Brooke, M.P.	..	..	17,171	31,241	48,412
1884	Malton	800	310	33	1218	Viscount Holmesdale	..	..	13,501	31,053	44,554
1885	Brighton	800	227	33	1142	Viscount Hampden	..	..	9,637	39,851	49,488
1886	Bristol	800	525	..	1325	Lord Carlisle	..	..	29,580	70,999	100,579
1887	Dorchester	800	..	112	912	Earl of Ilchester	..	..	8,860	29,846	38,706
1888	Newport (Mon.)	800	100	..	900	Lord Tredegar	..	..	14,878	38,567	53,445
1889	Exeter	800	..	..	810	Lord Clinton	..	..	16,405	36,195	52,600
1890	Rochester	800	294	..	1120	Earl of Darnley	..	..	3,480	48,314	51,794
1891	Bath	800	50	103	1003	Earl Temple	..	..	23,510	52,185	75,695
1892	Swansea	800	200	100	1110	Sir J. D. T. Llewellyn, Bart.	..	..	18,364	54,609	72,973
1893	Gloucester	800	400	..	1200	Lord Fitzhardinge	..	..	14,272	40,368	54,640
1894	Guildford	800	174	..	984	Earl of Onslow	..	..	8,671	29,813	38,484
1895	Taunton	800	85	160	1035	Viscount Portman	..	..	13,181	30,111	43,292
1896	St. Albans	800	152	..	952	Earl of Clarendon	..	..	12,056	22,380	34,436
1897	Southampton	800	50	..	850	Lord Montagu of Beaulieu	..	..	8,284	33,750	42,034
1898	Cardiff	800	200	..	1000	Lord Windsor	..	..	13,101	42,501	55,602
1899	Exeter	800	..	225	5	Lord Clinton	..	..	16,091	39,832	55,923
1900	Bath	800	100	150	1080	Marquis of Bath	..	954	11,601	36,814	48,415
1901	Croydon	800	115	..	915	(H.R.H. The Duke of Cornwall and York, K.G.)	..	1,196	9,362	30,693	41,251
1902	Plymouth	800	105	36	1041	Earl of Morley	..	842	12,029	40,565	52,594
1903	Bristol	800	434	60	1345	Duke of Beaufort	..	..	34,528	74,352	108,880
1904	Swansea	800	350	..	1150	Lord Windsor	..	..	28,265	50,562	78,827
1905	Nottingham	800	..	218	1018	Duke of Portland, K.G.	..	..	8,913	45,964	54,877

ANNUAL EXHIBITIONS—continued.

Year.	Place Visited.	Local Subscrip- tion.	Prizes.			Total Local Contri- bution.	President.	Admissions.				
			Local Com- mittee.	Local Societies.	Local Resi- dents.			On 5/- Day.	On 2/6 Days.	On 3/- Days.	On 1/- Days.	Total
1906	Swindon	£ 800	£ ..	£ 200	£ 50	£ 1050	Earl of Radnor	..	7,838		42,013	49,851
1907	Newport (Mon.)	800	201	51	29	1081	H.R.H. The Prince of Wales, K.G.	..	16,236		37,819	54,055
1908	Dorchester	800	100	25	..	925	Lord Digby	..	12,227		20,350	32,577
1909	Exeter	800	..	100	..	900	Lord Clinton	..	14,898		41,991	56,789
1910	Rocheater and Chatham	800	117	..	..	917	Earl of Darnley	..	5,892		20,105	25,997
1911	Cardiff	800	195	110	10	1115	Marquis of Bute	..	16,213		40,598	56,801
1912	Bath	800	100	100	..	1000	Marquis of Bath	..	13,843		40,935	54,788
1913	Truro	800	35	115	39	918	Viscount Falmouth	..	12,918		44,700	57,618
1914	Swansea	800	301	..	..	1101	Sir J. T. D. Llewelyn, Bart.	..	17,957		67,805	85,762
1915	Worcester	400	..	257	..	657	The Earl of Coventry	..	7,760		28,013	35,773
1916	No Shows											
1919	Salisbury	800	24	105	131	1060	The Earl of Radnor	..	4/-		2/-	
1920	Bristol	800	1000	354	..	2154	The Lord Bledisloe, K.B.E.	..	19,392		25,255	44,647
1921	Plymouth	800	132	281	200	1213	H.R.H. The Prince of Wales, K.G.	5165	36,068		58,473	99,646
1922	Swansea	800	295	100	29	1295	H.R.H. The Prince of Wales, K.G.	4124	19,289	20,558	34,856	58,269
1923	Taunton	800	29	100	29	929	Sir Dennis F. Poles, Bart. C.B.E.	434	12,286		78,192	115,345
1924	Maidstone	800	122	100	100	1022	D.L. Col. F. S. W. Cornwallis, C.B.E., D.L.	2267	9,693	17,892	16,121	45,963

(C.M.V.)

Members' Privileges.

ANALYSES OF FERTILISERS, FEEDING STUFFS, WATERS, SOILS, &c.

Applicable only to the case of Persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis).

Members of the Bath and West and Southern Counties Society, who may also be Members of other Agricultural Societies, are particularly requested in applying for Analyses, to state that they do so as Members of the first-named Society.

THE following are the rates of Charges for Chemical Analyses to Members of the Society.

These privileges are applicable only when the analyses are for *bona-fide* agricultural purposes, and are required by Members of the Society for their own use and guidance in respect of farms or land in their own occupation and within the United Kingdom.

The analyses are given on the understanding that they are required for the individual and sole benefit of the Member applying for them, and must not be used for other persons, or for commercial purposes.

Land or estate agents, bailiffs, and others, when forwarding samples are required to state the names of those Members on whose behalf they apply

Members are also allowed to send for analysis under these privileges any manures or feeding-stuffs to be used by their outgoing tenants, or which are to be given free of cost to their occupying tenants.

The analyses and reports may not be communicated to either vendor or manufacturer, except in cases of dispute.

Members are requested, when applying for an analysis, to quote the number in the subjoined schedule under which they wish it to be made.

No.		
1.	An opinion of the purity of bone-dust or oil-cake (each sample)	2s. 6d.
2.	An analysis of sulphate or muriate of ammonia, or of nitrate of soda, together with an opinion as to whether it be worth the price charged	5s.
3.	An analysis of guano, showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts and ammonia, together with an opinion as to whether it be worth the price charged	10s.
4.	An analysis of mineral superphosphate of lime for soluble phosphates only, together with an opinion as to whether it be worth the price charged	5s.
5.	An analysis of superphosphate of lime, dissolved bones, etc., showing the proportions of moisture, organic matter, sand, soluble and insoluble phosphates, sulphate of lime and ammonia, together with an opinion as to whether it be worth the price charged	10s.
6.	An analysis of bone-dust, basic slag, or any other ordinary artificial manure together with an opinion as to whether it be worth the price charged	10s.
7.	An analysis of compound artificial manures, animal products, refuse substances used for manure, etc. from 10s. to £1	
8.	An analysis of limestone, showing the proportion of lime	7s. 6d.
9.	An analysis of limestone, showing the proportion of lime and magnesia	10s.
10.	An analysis of limestone or marls, showing the proportion of carbonate, phosphate, and sulphate of lime and magnesia, with sand and clay	10s.
11.	Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime	£1
12.	Complete analysis of a soil	£2
13.	An analysis of oil-cake or other substance used for feeding purposes, showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre as well as of starch, gum, and sugar in the aggregate; and an opinion of its feeding and fattening or milk-producing properties	10s.
14.	Analysis of any vegetable product	10s.
15.	Determination of the "hardness" of a sample of water before and after boiling	5s.
16.	Analysis of water of land-drainage, and of water used for irrigation	£1
17.	Analysis of water used for domestic purposes	£1 10s.
18.	An analysis of milk (to assist Members in the management of their Dairies and Herds, <i>bona-fide</i> for their own information and not for trade purposes, nor for use in connection with the Sale of Food and Drugs Acts)	5s.
19.	Personal consultation with the Consulting Chemist. (To prevent disappointment it is suggested that Members desiring to hold a consultation with the Consulting Chemist should write to make an appointment)	5s.
20.	Consultation by letter	5s.
21.	Consultation necessitating the writing of three or more letters	10s.

Members wishing to exercise their privileges on the above-named terms, should forward their samples for examination *by post or parcel prepaid*, to the Consulting Chemist, Dr. JOHN AUGUSTUS VOELCKER, M.A., F.I.C., Stuart House, 1, Tudor Street, London, E.C.

The fee for analysis must be sent to the Consulting Chemist at the time of application.

GUIDE TO PURCHASERS OF FERTILISERS AND FEEDING STUFFS.

Purchasers are recommended in every case to insist upon having an *Invoice* given to them. This invoice should set out clearly :—

In the case of Fertilisers—

- (1) The name of the fertiliser ;
- (2) Whether the fertiliser be artificially **compounded** or not ;
- (3) The **analysis** guaranteed in respect of the principal fertilising ingredients.

In the case of Feeding-Stuffs—

- (1) The name of the article ;
 - (2) The description of the article : whether it has been made from one substance or seed only, or from more than one ;
 - (3) The **analysis** guaranteed in respect of Oil and Albuminoids.
- (NOTE.—The use of terms "Linseed-cake," "Cotton-cake," etc., implies that these cakes shall be "pure" and purchasers are recommended to insist upon these terms being used without any qualification such as "95 per cent.," "as imported," etc. "Oil-cake" should be avoided.

Members of the Society should see that the *Invoices* agree accurately with the orders given by them, and, in giving these orders, they should stipulate that the goods come up to the guarantees set out in the following list, and that they be sold subject to the analysis and report of the Consulting Chemist of the Bath and West and Southern Counties Society.

FERTILISERS.

Raw Bones, Bone-meal, or Bone-dust to be guaranteed "**PURE**," and to contain not less than 45 per cent. of Phosphate of Lime, and not less than 4 per cent. of Ammonia.

Steamed or "Degelatinised" Bones to be guaranteed "**PURE**," and to contain not less than 55 per cent. of Phosphate of Lime, and not less than 1 per cent. of Ammonia.

Mineral Superphosphate of Lime to be guaranteed to contain a certain percentage of "Soluble Phosphate." [From 25 to 28 per cent. of Soluble Phosphate is an ordinarily good quality.]

Dissolved Bones to be guaranteed to be "made from raw bone and acid only," and to be sold as containing stated percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia.

Compound Artificial Manures, Bone Manures, Bone Compounds, etc., to be sold by analysis stating the percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia contained.

Basic Slag to be guaranteed to contain a certain percentage of Phosphoric Acid, and to be sufficiently finely ground that 80 to 90 per cent. passes through a sieve having 10,000 meshes to the square inch.

Peruvian Guano to be described by that name, and to be sold by analysis stating the percentages of Phosphates and Ammonia.

Sulphate of Ammonia to be guaranteed to be "**PURE**," and to contain not less than 24 per cent. of Ammonia.

Nitrate of Soda to be guaranteed to be "**PURE**," and to contain 95 per cent. of Nitrate of Soda.

FEEDING-STUFFS.

Linseed Cake, Cotton Cake (Decorticated and Undecorticated), and **Rape Cake** (for feeding purposes) to be pure, i.e., prepared *only* from one kind of seed from which their name is derived, and to be in sound condition. The report of the Consulting Chemist of the Bath and West and Southern Counties Society to be conclusive as to the "purity" or otherwise of any feeding-stuffs. The percentages of Oil and Albuminoids must also be guaranteed.

Mixed Feeding Cakes, Meals, etc., to be sold on a guaranteed analysis.

All Feeding-Stuffs to be sold in sound condition, and to contain nothing of an injurious nature or worthless for feeding purposes.

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

GENERAL RULES.

1. A sample taken for analysis should be fairly *representative of the bulk* from which it has been drawn.
- 2.—The sample should reach the Analyst *in the same condition* as it was at the time when drawn.

FERTILISERS.

When **Fertilisers** are delivered in bags, select four or five of these from the bulk, and either turn them out on a floor and rapidly mix their contents, or else drive a shovel into each bag and draw out from as near the centre as possible a couple of shovelfuls of the manure, and mix these quickly on a floor.

Halve the heap obtained in either of these ways, take one-half (rejecting the other) and mix again rapidly, flattening down with the shovel any lumps that appear. Repeat this operation until at last only some three or four pounds are left.

From this fill three tins, holding from $\frac{1}{2}$ lb. to 1 lb. each, mark, fasten up and seal each of these. Send one for analysis, and retain the others for reference.

Or,—the manure may be put into glass bottles provided with well-fitting corks the bottles should be labelled and the corks sealed down. The sample sent for analysis can be packed in a wooden box and sent by post or rail.

When manures are delivered in bulk, portions should be successively drawn from *different parts* of the bulk, the heap being turned over now and again. The portions drawn should be thoroughly mixed, sub-divided, and, finally, samples should be taken as before, except that when the manure is coarse and bulky it is advisable to send larger samples than when it is in a finely-divided condition.

FEEDING-STUFFS.

Linseed, Cotton, and other Feeding Cakes.—If a single cake be taken three strips should be broken off right across the cake and from the middle portion of it, one piece to be sent for analysis, and the other two retained for reference. Each of the three pieces should be marked, wrapped in paper, fastened up and sealed. The piece forwarded for analysis can be sent by post or rail.

A more satisfactory plan is to select four to six cakes from different parts of the delivery, then break off a piece about four inches wide from the middle of each cake, and pass these pieces through a cake-breaker. The broken cake should then be well mixed, and three samples of about 1 lb. each should be taken and put in tins or bags duly marked, fastened, and sealed as before. One of

these lots should be sent for analysis, the remaining two being kept for reference. It is advisable also, with the broken pieces, to send a small strip from an unbroken cake.

Feeding Meals, Grain, etc.—Handfuls should be drawn from the centre of half-a-dozen different bags of the delivery; these lots should then be well mixed, and three $\frac{1}{2}$ lb. tins or bags filled from the heap, each being marked, fastened up, and sealed. One sample is to be forwarded for analysis and the others retained for reference.

SOILS, WATERS, &c.

Soils.—Have a wooden box made, 6 inches in length and width, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil and its subsoil 9 to 12 inches deep; trim this block to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up gently, turn over the box, nail on the lid, and send by rail. The soil will then be received in the position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

Waters.—Samples of water are best sent in glass-stoppered Winchester bottles holding half a gallon. One such bottle is sufficient for a single sample. Care should be taken to have these scrupulously clean. In taking a sample of water for analysis it is advisable to reject the first portion drawn or pumped, so as to obtain a sample of the water when in ordinary flow. The bottle should be rinsed out with the water that is to be analysed, and it should be filled nearly to the top. The stopper should be secured with string, or be tied over with linen or soft leather. The sample can then be sent carefully packed either in a wooden box with sawdust, etc., or in a hamper with straw.

Milk.—A pint bottle should be sent in a wooden box.

GENERAL INSTRUCTIONS.

Time for Taking Samples.—All samples, both of fertilisers and feeding-stuffs, should be taken as soon after their delivery as possible, and should reach the Analyst within *ten days* after delivery of the article. In every case it is advisable that the Analyst's certificate be received before a fertiliser is sown or a feeding-stuff is given to stock.

Procedure in the event of the Vendor wishing Fresh Samples to be Drawn.—Should a purchaser find that the Analyst's certificate shows a fertiliser or feeding-stuff not to come up to the guarantee given him, he may inform the vendor of the result and complain accordingly. He should then send to the vendor *one* of the two samples which he has kept for reference. If, however, the vendor should demand that a fresh sample be drawn, the purchaser must allow this, and also give the vendor an opportunity of being present, either in person or through a representative whom he may appoint. In that case, three samples should be taken in the presence of both parties with the same precautions as before described, *each* of which should be duly packed up, labelled and *sealed* by both parties. One of these is to be given to the vendor, one is to be sent to the Analyst, and the third is to be kept by the purchaser for reference or future analysis if necessary.

All samples intended for the Consulting Chemist of the Society should be addressed (postage or carriage prepaid) to Dr. J. AUGUSTUS VOELCKER, M.A., F.I.C., Stuart House, 1, Tudor Street, New Bridge Street, London, E.C. Separate letters of instruction should be sent at the same time.

MAIDSTONE MEETING,

MAY 28, 29, 30, JUNE 1 and 2, 1925.

MONEY PRIZES.

							PAGE
HORSES	£1212	0	0				cxxxix
CATTLE	1499	5	0				cxl
SHEEP	659	0	0				cxlvii
GOATS	28	10	0				cl
PIGS	574	0	0				cl
CIDER	70	0	0				cliii
HOPS	80	0	0				cliii
CHEESE	71	0	0				cliv
CREAM CHEESE, BUTTER AND CREAM ..	46	10	0				cliv
BUTTER-MAKING	38	0	0				clv
MILKING	11	5	0				clv
SHONING	56	10	0				clv
POULTRY	161	5	0				clxvii
	£4,507	5	0				

DONORS OF MEDALS, PLATE, &c.

H.R.H. The Prince of Wales, K.G.	Dexter Cattle Society
Bath and West Society	English Jersey Cattle Society
Shire Horse Society	G. H. Johnstone, Esq.
Hunters' Improvement and National	Major the Hon. J. J. Astor
Light Horse Breeding Society	R. Bruce Ward, Esq.
Arab Horse Society	Southdown Sheep Society
Hackney Horse Society	Sir F. H. Bathurst, Bart., D.S.O.
National Pony Society	British Goat Society
Shorthorn Society	British Berkshire Society
Aberdeen-Angus Cattle Society	Large Black Pig Society
Sussex Herd Book Society	National Pig Breeders' Association
English Aberdeen-Angus Cattle	Gloucestershire Old Spots Pig Society
Association	Wessex Saddleback Pig Society
Argentine Aberdeen-Angus Cattle	Poultry Club
Association	

DONORS OF MONEY PRIZES.

Bath and West and Southern Counties Society	£3447	5	0
Kent County Agricultural Society	100	0	0
Maidstone Local Committee	122	0	0
Shire Horse Society (or Medal)	10	0	0
British Percheron Horse Society	20	0	0
Suffolk Horse Society	20	0	0
Arab Horse Society	22	10	0
Devon Cattle Breeders' Society	10	0	0
South Devon Herd Book Society	15	5	0
Shorthorn Society	30	0	0
Dairy Shorthorn Association	10	0	0
E. Ezra, Esq.	17	0	0
Hereford Herd Book Society	20	0	0
Sussex Herd Book Society	32	0	0
British Friesian Cattle Society	89	0	0
English Aberdeen-Angus Cattle Association	20	0	0
Red Poll Cattle Society	25	0	0
Welsh Black Cattle Society	10	0	0
Meyrick Sir Geo... ..	15	0	0
Ayrshire Cattle Society	15	0	0
English Jersey Cattle Society	10	0	0
English Guernsey Cattle Society	25	0	0
British Kerry Cattle Society	15	0	0
Dexter Cattle Society	15	0	0
Devon Longwoolled Sheep Breeders' Society	10	0	0
Kent or Romney Marsh Sheep Breeders' Association	60	0	0
Southdown Sheep Society	17	0	0
Hampshire Down Sheep Breeders' Association	20	0	0
Oxford Down Sheep Breeders' Association	10	0	0
Dorset Horn Sheep Breeders' Association	18	0	0
Dorset Down Sheep Breeders' Association	20	0	0
Suffolk Sheep Society	25	0	0
Ryeland Flock Book Society	15	0	0
Kerry Hill Flock Book Society	12	0	0
British Goat Society	14	5	0
British Berkshire Society	9	0	0
Large Black Pig Society	40	0	0
National Pig Breeders' Association	5	0	0
Gloucester Old Spots Pig Society	20	0	0
Wessex Saddleback Pig Society	24	0	0
Long White Lop-Eared Pig Society	20	0	0
Lord Bledisloe	5	0	0
Kent Education Committee	18	0	0

£4507 5 0

PRIZES.

The Prizes in Classes 47, 48, 49 and 235 to 238 are offered by the Maidstone Local Committee and the Prizes in Classes 31, 46 and 141, the Champion Prizes in the Kent Sheep Classes and £33 towards the other Prizes in the Horses, Cattle, Sheep and Pig Classes by the Kent County Agricultural Society.

An Animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of those Prizes headed as Champion or Special Prizes.

HORSES.

Exhibitors are requested to note that Animals entered in Classes 1 to 14 must be in the Yard before 8 a.m. on Thursday, May 28, and except the Stallions in Class 6, (which can be removed after the Parade of Horses on the third day of the Show) must remain in the Yard till 6 o'clock on Tuesday, June 2

SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book).

Entrance Fees.—Classes 1 and 3 to 7, including Box : Members, 25/- ; Non-Members, 50/- each entry. Class 2, Members, 5/- ; Non-Members, 10/- each entry.

Judge—T. EWART, Dunsmore Home Farm, nr. Rugby.

CLASS.	First Prize.	Second Prize.	Third Prize.
	£	£	£
1.—MARE, in-foal, or with foal at foot	15	10	3
2.—COLT or FILLY FOAL, produce of Mare in Class 1 ..	5	3	
3.—FILLY or GELDING, foaled in 1924	10	5	3
4.—FILLY or GELDING, foaled in 1923	10	5	3
5.—FILLY or GELDING, foaled in 1922	10	5	3
6.—STALLION, foaled in 1923	10	5	3
7.—COLT, foaled in 1924	10	5	3

MEDAL. (A)

Offered by the Shire Horse Society and open only to Members of the Bath and West Society elected not less than six months previous to March 31, 1925.

(A) A Gold Medal, or the sum of \$5, for the best Mare or Filly in the Shire Horse Classes, under Condition 47, and to the Breeder of the winner under the Condition stated, a Prize of 5

First Prize. £	Second Prize. £	Third Prize. £
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PERCHERONS.

Entry Fees, including Box: Classes 8, 10 and 11: Members, 25/-; Non-Members, 50/-. Class 9, Members, 5/-; Non-Members, 10/- each entry.

£20 towards the prizes in Classes 8 to 11 are contributed by the British Percheron Horse Society.

Judge—G. FENWICK, North Luffenham Hall, Stamford.

CLASS

8.—MARE, in-foal, or with foal at foot	10	5	3
9.—COLT or FILLY FOAL, produce of Mare in Class 8 ..	5	3	
10.—FILLY, foaled in 1923	10	5	3
11.—FILLY, foaled in 1922	10	5	3

SUFFOLK.

Entry Fees, including Box: Classes 12 and 14, Members, 25/-, Non-Members, 50/-. Class 13, Members, 5/-, Non-Members, 10/- each entry.

£20 towards the prizes in Classes 12 to 14 are contributed by the Suffolk Horse Society.

Judge.—D. F. SMITH, Easton, Wickham Market.

12.—MARE, in foal, or with foal at foot	10	5	3
13.—COLT or FILLY FOAL, produce of Mare in Class 12 ..	5	3	
14.—COLT, FILLY or GELDING, foaled in 1922 or 1923 ..	10	5	3

HUNTERS.

Entry Fees, Classes 15 and 17 to 24, including Box: Members, 25/-; Non-Members, 50/-. Class 16, Members, 5/-, Non-Members, 10/- each entry.

Animals entered in Classes 15 to 24 must be in the Yard before 8 a.m.

on Thursday, May 28, and must remain there till 1 p.m. on Saturday,

May 30, when they must be removed from the yard.

Judge—Major W. P. CANTRELL-HUBBERSTY, Ragdale Hall, Leicestershire.

CLASS.

15.—MARE, in-Foal, or with Foal at Foot	15	10	3
16.—COLT or FILLY FOAL, produce of Mare in Class 15 ..	5	3	
17.—FILLY, COLT or GELDING, foaled in 1924	10	5	3
18.—FILLY, COLT or GELDING, foaled in 1923	10	5	3
19.—FILLY or GELDING, foaled in 1922	10	5	3
20.—MARE or GELDING, foaled before 1922, that has not won a prize of £10 or over under saddle at any Show held previous to April 1, 1925	10	5	3
21.—MARE or GELDING, foaled in 1921	10	5	3
22.—MARE or GELDING, foaled before 1922, to carry not more than 12 stone 7 lbs.	20	10	3
23.—MARE or GELDING, foaled before 1922, to carry over 12 stone 7lbs. and under 14 stone	20	10	3
24.—MARE or GELDING, foaled before 1922 to carry 14 stone or over	20	10	3

HUNTERS—Continued.

MEDALS.

Offered by the Hunters' Improvement and National Light Horse Breeding Society, under Conditions 48 and 49.

- (B) A Gold Medal, or \$5 and a Bronze Medal, for the Best Hunter Brood Mare in Class 16, registered with a number in the Hunter Stud Book, at the time of entry or within a month of the award, not having previously won the above-named Society's Gold Medal as a Brood Mare in 1925, and which must have her foal at foot, or produce a living foal in 1925 to a thoroughbred horse or Registered Hunter sire. In the second instance a certificate to that effect must be forwarded before the Medal is sent.
- (C) A Silver Medal or \$1 (at the option of the winner), for the best Hunter Mare or Gelding of any age, exhibited in Classes 20 to 24 by a member of the Hunters' Improvement and National Light Horse Breeding Society, whose application for membership must be lodged within a month of the award.

Only Prize-Winners in the Classes will be eligible for these Medals.

ARABS AND PONIES.

Animals entered in Classes 25 to 30 must be in the Yard after 6 p.m. on Saturday, May 30, and before 8 a.m. on Monday, June 1, and must remain in the Yard until 6 p.m. on Tuesday, June 2.

ARABS.

- (A) Entries in Classes 25 to 27 must be registered or accepted for registration in the Arab Horse Stud Book.

\$22 10s. towards the prizes in these Classes are contributed by the Arab Horse Society.

Entry Fee : 10/- each entry.

Judge—

25.—MARE, in-foal or with foal at foot	10	5	3
26.—STALLION, any age	10	5	3
27.—COLT or FILLY, foaled in 1922, 1923 or 1924	10	5	3

SILVER MEDALS.

Offered by the Arab Horse Society.

- (D) Best Mare or Filly in Class 25 or 27
- (E) Best Stallion or Colt in Class 26 or 27

POLO AND RIDING PONIES.

Animals entered in Classes 28 to 30 must be entered in the National Pony Stud Book or registered in the Approved Mare Register.

Judge—Rev. D. B. MONTEFIORE, 15, Wyndham Street, Brighton.

28.—MARE, not exceeding 15 hands, in foal or with foal at foot	10	5	3
29.—FILLY or GELDING, foaled in 1921, 1922 or 1923	10	5	3
30.—Stallion, not exceeding 15 hands, any age	10	5	3

SILVER MEDAL.

Offered by the National Pony Society.

- (F) Best exhibit in Class 28.

First Prize.	Second Prize.	Third Prize
£	£	£

ANY AGRICULTURAL BREED.

Animals entered in Class 31 must be in the Yard by 9 a.m. on Tuesday,
June 2, and can leave after they have been judged and paraded.

**Entry Fees : Members, 5/- ; Non-Members, 10/-
each entry.**

Judge—

The prizes in Class 31 are offered by the Kent County Agricultural Society.

CLASS.

**31.—Mare or Gelding, foaled in or before 1922, suitable for
Agricultural work and the property of a resident in
the County of Kent, to be shown in hand without
gear** **8 4 3**

REMOUNT SELLING CLASSES.

Animals entered in Classes 32 and 33 must be in the Yard by 12 noon on
Friday, May 29, and can leave after they have been judged and paraded.

**Entry Fees : Members, 5/- ; Non-Members, 10/-
each entry.**

Judge : Inspector of Remounts.

CLASS.

**32.—MARE or GELDING, not under 4 years nor over 6 years
old, not less than 15 nor over 15.2½ hands,
undocked, suitable for a cavalry troop horse ..** **10 5**

The Director of Remounts to have the option of purchasing
any animal in this Class, if ridden, for a sum not exceeding
£55, or, if shown in hand, for a sum not exceeding £50.

**33.—MARE or GELDING, light draught, not under 4 years nor
over 7 years old, not less than 15.1½ nor
over 15.3 hands, weight not to be less than 1,200
lbs., suitable for Royal Horse or Royal Field
Artillery** **10 5**

The Director of Remounts to have the option of purchasing
any animal in this Class for a sum not exceeding £55.

Horses shown in these two Classes to have been bred in Great Britain
or Ireland, and to be certified as sound and free from vice.

SADDLE.

Horses entered in other Classes can, if eligible, be also entered on payment of an additional fee in the Saddle Classes.

Horses entered in the Saddle Classes only, and not having a Box in the yard, must be in the Show Yard by 1 p.m. on the day on which they compete, and, with the consent of the Stewards, may leave the Prize Yard as soon as the class has been judged.

First	Second	Third
Prize.	Prize.	Prize.
£	£	£

ENTRIES CLOSE.

With Boxes—April 2, or at double fees, April 9.

Without Boxes—At 12 noon on the day preceding the competition.

Entry Fees : With Box, Members, 25/- ; Non-Members, 50/- each entry ; Without Box : Members, 5/- ; Non-Members, 10/-.

Judge—Major W. P. CANTRELL-HUBBERSTY, Ragdale Hall, Leicestershire.

CLASS

34.—HACK MARE or GELDING, 15 hands and over, to be ridden on the 2nd day of the Show 10 5 2

35.—PONY, not over 13 hands, suitable for and to be ridden by a child not over 12 years of age last birthday, on the 2nd day of the Show 5 4 2

Fourth £1.

(A Whip will be presented to the best Boy and best Girl Riders in this Class.)

36.—HACK MARE or GELDING, any height, to be ridden by a lady on the 3rd day of the Show 10 5 2

37.—STALLION, MARE or GELDING, entered or accepted for the Arab Stud Book or the Arab bred Register, to be ridden on the 4th day of the show and to be judged by an Arab judge 10 5 2

38.—HACK MARE or GELDING, under 15 hands, to be ridden on the 4th day of the Show 10 5 2

39.—POLO PONY, not over 15 hands, 4 years old and over, to be ridden on the 5th day of the Show and to be judged by a Polo Pony judge 10 5 2

40.—PONY, not over 14 hands, suitable for and to be ridden by a child not over 14 years of age last birthday, on the 5th day of the Show 5 4 2

Fourth £1

(A Whip will be presented to the best Boy and best Girl Riders in this Class).

SILVER MEDAL.

Offered by the National Pony Society.

(G) Best exhibit in Class 39, entered or eligible for entry in the National Pony Stud Book or registered in the Approved Mare Register.

HARNESS.

Horses entered in other Classes can, if eligible, be also entered on payment of an additional fee in the Harness Classes.

Horses entered in the Harness Classes only, and not having a Box in the yard, must be in the Show Yard by 1 p.m. on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as the class has been judged.

ENTRIES CLOSE.

With Boxes—April 2, or at double fees, April 9.

Without Boxes—At 12 noon on the day preceding the competition.

Entry Fees: With Box, Members, 25/-; Non-Members, 50/- each entry; Without Box: Members, 5/-; Non-Members, 10/-.

Judge—F. VIVIAN GOOCH, Junior Constitutional Club, Piccadilly, London.

CLASS.	First Prize. £	Second- Prize. £	Third Prize. £	Fourth Prize £
41.—(Novice Class). MARE OR GELDING, not over 14 hands, that has not previously won a prize of over £5 in value in Single Harness at any show held previous to January 1, 1925, to be driven on the 1st day of the Show	10	5	3	2
42.—(Novice Class). MARE OR GELDING, over 14 and not over 15 hands, that has not previously won a prize of over £5 in value in Single Harness at any Show held previous to January 1, 1925, to be driven on the 1st day of the Show ..	10	5	3	2
43.—(Novice Class). MARE OR GELDING, over 15 hands that has not previously won a prize of over £5 in value in Single Harness at any Show held previous to January 1, 1925, to be driven on the 2nd day of the Show	10	5	3	2

CHAMPION PRIZE.

(H) Best Mare or Gelding shown in Single Harness in Classes 41 to 43, to be judged on the 2nd day of the Show (First Prize winners in the Classes mentioned must compete)	10			
44.—Pair of MARES or GELDINGS, to be driven in Double Harness on the 3rd day of the Show	15	7	3	2
45.—TANDEM, MARES or GELDINGS, to be driven on the 3rd day of the Show	15	7	3	2

The prizes in Class 46 are offered by the Kent County Agricultural Society.

46.—Mare or Gelding, any height, the property of a resident in Kent, to be driven on the 3rd day of the Show	8	4	2	
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First Prize. £	Second Prize. £	Third Prize. £	Fourth Prize £
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LOCAL TRADESMEN.

The prizes in Classes 47, 48 and 49 are offered by the Maidstone Local Committee.

47.—Light Mare or Gelding, the property of a Tradesman either resident or carrying on business within the County of Kent, to be exhibited in light two-wheeled vehicle, both horse and vehicle bona fide used for purposes of his trade only for not less than three months prior to May 28, 1925, on the 4th day of the Show	5	4	3	2
48.—Light Mare or Gelding, ditto, ditto, to be exhibited in light four-wheeled vehicle, ditto, ditto	5	4	3	2
49.—Heavy Mare or Gelding, the property of a Tradesman either resident or carrying on business within the County of Kent, to be exhibited in heavy two or four-wheeled vehicle, ditto, ditto	5	4	3	2

In Classes 47 to 49 licensed vehicles are ineligible).

50.—MARE or GELDING, not exceeding 14 hands, to be driven on the 4th day of the Show	15	7	3	2
51.—MARE or GELDING, over 14 and not exceeding 15 hands, to be driven on the 4th day of the Show	15	7	3	2
52.—MARE or GELDING, over 15 hands, to be driven on the 5th day of the Show	15	7	3	2

CHAMPION PRIZE.

- (I) Best Mare or Gelding shown in any of the Open Harness Classes 44 to 52, to be judged on the 5th day of the Show. (First prize winners in the Classes mentioned must compete) 10

MEDAL (J).

Offered by the Hackney Horse Society under Conditions No. 50.

- (J) A Silver Medal for the best Mare or Gelding exhibited in Single Harness in Classes 41 to 52, to be judged on the 5th day of the Show

JUMPING.

(UNDER SHOW JUMPING ASSOCIATION RULES).

Horses can be entered in as many Jumping Classes as they are eligible for on payment of the entry fee for each Class, and can take Second or Third Prize in each class, but only one First Prize in Classes 53 to 57. In the event of an animal which has already won a First Prize in the aforesaid Classes being again placed First, the Animal next in point of merit will, if eligible, succeed to the First Prize, and the Stewards reserve the right to amend the Awards correspondingly, and, if necessary, to reduce proportionately the amounts paid to the other Prize Winners in the Class. The award to two or more exhibits of an equal First by the Judges, other than in the case of competitors agreeing to divide, will not debar such Animals from taking a First Prize in a later class.

Horses entered in the Jumping Classes only, and not having a box in the Yard, must be in the Show Yard by 1 p.m. on the day on which they compete and, with the consent of the Stewards, may leave the Yard as soon as the Class has been judged. A covered shed will be provided for exhibits in these Classes.

ENTRIES CLOSE.

With Boxes—April 2, or at double fees, April 9.

Without Boxes—At 12 noon on the day preceding the competition

Entry Fees : With Box, Members, 25/- ; Non-Members, 50/- each entry ; Without Box : Members, 5/- ; Non-Members, 10/-.

The Society reserves the right to cancel the Classes for Jumping in the event of sufficient entries not being forthcoming. In such case notice will be given to Exhibitors and any Entry Fee paid will be returned.

(For Regulations as to Jumping Classes see Conditions 51).

Judge—Sir H. H. A. HOARE, Bart., Stourhead, Zeals, S.O., Wilts.

CLASS.	First Prize.	Second Prize.	Third Prize.
53.—MARE or GELDING, 15 hands and over, that shall jump over the course in the best form on the 1st day of the Show	10	5	2
54.—MARE or GELDING, under 15 hands, ditto, 1st day ..	10	5	2
55.—MARE or GELDING, 15 hands and over, that shall jump over the course in the best form on the 2nd day of the Show	10	5	2
56.—MARE or GELDING, under 15 hands, ditto, 2nd day ..	10	5	2
57.—MARE or GELDING, any height, that shall jump over the course in the best form on the 3rd day of the Show	10	5	2
58.—MARE or GELDING, any height, that shall jump highest on the 3rd day of the Show	10	5	2

JUMPING—Continued.

59.—MARE or GELDING, 15 hands and over, that shall jump over the course in the best form on the 4th day of the Show						15	7	3
60.—MARE or GELDING, under 15 hands, ditto, 4th day ..						15	7	3
61.—MARE or GELDING, any height, that shall jump highest on the 5th day of the Show						15	7	3

CHAMPION CLASS.

62.—MARE or GELDING, any height, having won a Prize in Classes 53 to 61 that shall jump over the course in the best form on the 5th day of the Show ..						20	10	5
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(In this Class the whole of the Jumps will be raised at the discretion of the Stewards).

(In Classes 58 and 61, £1 will be added to the prizes offered for every
six inches over 5 feet cleared by the winning animals).

First Prize. £	Second Prize. £	Third Prize £
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CATTLE.

Entry Fees : Members, 17/6 ; Non-Members, 35/-,
each entry.

DEVON.

Judge—L. H. ALFORD, Horridge, Ashford, Barnstaple, N.Devon

CLASS.

63.—COW or HEIFER, in-Milk, calved in or before 1922 ..	10	5	2
64.—HEIFER, calved in 1923	10	5	2
65.—HEIFER, calved in 1924	10	5	2
66.—BULL, calved in or before 1923	10	5	2
67.—BULL, calved in 1924	10	5	2

CHAMPION PRIZES.

Offered by H.R.H. the Prince of Wales, K.G.

A Challenge Cup, value £30 for the best Bull exhibited in Class 66 or 67 to be won three times in succession or four times altogether before becoming the property of the winner.

Offered by the Devon Cattle Breeders' Society.

Best Animal exhibited in Classes 63 to 67 10

SOUTH DEVON.

Judge—H. W. PEEKE, Paensford, Harbertonford, Totnes.

£10 towards the Prizes in the South Devon Classes are contributed by the South Devon Herd Book Society.

68.—COW or HEIFER, in-Milk, calved in or before 1922 ..	10	5	2
69.—HEIFER, calved in 1923	10	5	2
70.—HEIFER, calved in 1924	10	5	2
71.—BULL, calved in or before 1923	10	5	2
72.—BULL, calved in 1924	10	5	2

CHALLENGE CUP.

Offered by H.R.H. The Prince of Wales, K.G.

A Silver Challenge Cup for the best Cow in-Milk in the South Devon Classes, to be won three times in succession or four times altogether before becoming the property of the Winner.

SHORTHORN.

Judge—J. PETER, Old Vicarage, Berkeley, Glos.

73.—COW or HEIFER, in-Milk, calved in or before 1922 ..	10	5	2
74.—HEIFER, calved in 1923	10	5	2
75.—HEIFER, calved in 1924	10	5	2
76.—BULL, calved in 1921 or 1922	10	5	2
77.—BULL, calved in 1923	10	5	2
78.—BULL, calved in 1924	10	5	2

CHAMPION PRIZE.

Offered by the Shorthorn Society.

Best Bull in Classes 76 to 78 entered in, or eligible for entry in Coates's Herd Book, with Silver Medal to the Breeder 10

First Prize.	Second Prize.	Third Prize.
£	£	£

DAIRY SHORTHORN.

Judge—J. L. SHIRLEY, Silverton, Bletchley, Bucks.

The First Prizes in Classes 79 and 80 (and a Silver Medal to the Breeder of the winners) are offered by the Shorthorn Society and the First Prize in Class 84 by the Dairy Shorthorn Association.

79.—Pedigree Cow, in-Milk, calved in or before 1921, eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society in 1925, to be milked in the Ring before judging, under Conditions 59	10	5	2
80.—Ditto, calved in or after 1922, ditto	10	5	2
81.—PEDIGREE HEIFER, calved in 1923	10	5	2

The Prizes in Class 82 are offered by E. Ezra, Esq., of Lock, Partridge Green, Sussex.

82.—Pedigree Heifer, calved in 1924, eligible for and entered in Coates's Herd Book or pedigree sent for such entry previous to the Show, subject to Conditions No. 60	10	5	2
83.—Pedigree Bull, calved before 1924	10	5	2
84.—Pedigree Bull, calved in 1924, entered or pedigree accepted for entry in Coates's Herd Book, subject to Conditions No. 60	10	5	2

HEREFORD.

Judge—H. R. EVANS, Court of Noke, Pembridge, Herefordshire

85.—COW OR HEIFER, in-Milk, calved in or before 1922 ..	10	5	2
86.—HEIFER, calved in 1923	10	5	2
87.—HEIFER, calved in 1924	10	5	2
88.—BULL, calved in 1921 or 1922	10	5	2
89.—BULL, calved in 1923	10	5	2
90.—BULL, calved in 1924	10	5	2

CHAMPION PRIZES.

Offered by the Hereford Herd Book Society.

Best registered Cow or Heifer in Classes 85 to 87 ..	10
Best registered Bull in Classes 88 to 90	10

SUSSEX.

Judge—S. A. HINKLEY, Stag Park, Petworth, Sussex.

£32 towards the Prizes in the Sussex Classes and the Silver Medals are offered by the Sussex Herd Book Society.

CLASS.

91.—Cow or Heifer, in-Milk, calved in or before 1922 ..	10	5	2
92.—HEIFER, calved in 1923	10	5	2
93.—HEIFER, calved in 1924	10	5	2
94.—BULL, calved in or before 1923	10	5	2
95.—BULL, calved in 1924	10	5	2

SILVER MEDALS.

Best Cow or Heifer in Class 91 to 93.
Best Bull in Class 94 or 95.

First Prize. £	Second Prize. £	Third Prize. £
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BRITISH FRIESIAN.**Judge—W. BROWN, Old Park Farm, Bosham.**

£24 towards the Prizes in the Friesian Classes are contributed by the British Friesian Cattle Society, and animals entered must be registered in the B.F.C.S. Herd Book proper, those registered in Supplementary Section not being eligible.

96.—Cow or HEIFER, any age, in-Milk	10	5	2
97.—HEIFER, not in-Milk, calved in 1923	10	5	2
98.—HEIFER, calved in 1924	10	5	2
99.—BULL, calved in or before 1922	10	5	2
100.—BULL, calved in 1923	10	5	2
101.—BULL, calved in 1924	10	5	2

ABERDEEN-ANGUS.**Judge—G. G. MACDONALD, Apethorpe, Peterborough**

£20 towards the Prizes in the Aberdeen-Angus Classes are contributed by the English Aberdeen-Angus Cattle Association.

102.—Cow or HEIFER, in-Milk, calved before 1st December, 1922	10	5	2
103.—HEIFER, calved on or after 1st December, 1922 ..	10	5	2
104.—HEIFER, calved on or after 1st December, 1923 ..	10	5	2
105.—BULL, calved before 1st December, 1923	10	5	2
106.—BULL, calved on or after 1st December, 1923 ..	10	5	2

CHAMPION PRIZES.

Offered by the Aberdeen-Angus Cattle Society.

A Silver Medal for the best Animal in Classes 102 to 106.

Offered by the English Aberdeen-Angus Cattle Association.

A Silver Medal for the best animal of opposite sex.

Offered by the Argentine Aberdeen-Angus Association.

A Silver Medal for the best Animal in Classes 102 to 106 bred by the Exhibitor.

CHALLENGE CUP.

Offered by the English Aberdeen-Angus Cattle Association.

The Venning Cup for the Exhibitor gaining the most points in the Aberdeen-Angus Classes on the basis of 4 points for a first prize, 3 points for a second, 2 points for a third, one point for a Reserve, 2 points for a Championship, and one point for a Reserve Championship. The Cup to be won twice in succession or three times in all before becoming the property of the Exhibitor.

First Prize. £	Second Prize. £	Third Prize £
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RED POLL.

Judge—J. E. QUESTED, The Firs, Cheriton, Kent.

£20 towards the Prizes in the Red Poll Classes are contributed by the Red Poll Cattle Society.

CLASS.

107.—Cow or HEIFER, in-milk, calved before 1923 ..	10	5	2
108.—HEIFER, calved in 1923	10	5	2
109.—HEIFER, calved in 1924	10	5	2
110.—BULL, calved in or before 1922	10	5	2
111.—BULL, calved in 1923	10	5	2
112.—BULL, calved in 1924	10	5	2

WELSH BLACK.

Judge—D. JENKINS, Nenadd-yr-ynys, Taliesin, Card.

£10 towards the Prizes in the Welsh Black Classes are contributed by the Welsh Black Cattle Society, and £15 by Sir Geo. Meyrick, and animals must be registered or eligible for registration in the Welsh Black Cattle Herd Book.

113.—Cow or HEIFER, in-Milk, calved on or before November 30th, 1922	10	5	2
114.—HEIFER, calved on or between December 1st, 1922, and November 30th, 1923	10	5	2
115.—HEIFER, calved in or between December 1, 1923 and November 30, 1924	10	5	2
116.—BULL, calved in 1922, 1923 or 1924	10	5	2

AYRSHIRE.

Judge—A. STEEL, 162, Victoria Avenue, Southend-on-Sea.

£15 towards the Prizes in the Ayrshire Classes are contributed by the English Committee of the Ayrshire Cattle Herd Book Society, and animals entered must be registered or eligible for registration in the Society's Herd Book.

117.—Cow, in Milk, calved in or before 1921	10	5	2
118.—HEIFER, in-Milk, calved after January 1st, 1922	10	5	2
119.—HEIFER, calved after September 1st, 1923	10	5	2

JERSEY.

Judges—

Cows and Heifers—W. ADAMS, The Thorns, Bebington, Cheshire.

Bulls—Hon. ALEXANDER PARKER, Norton Curlien, Warwick

The Prizes in Class 120 are offered by the English Jersey Cattle Society.

120.—Cow or Heifer, in-Milk, entered in or eligible for entry in the English Jersey Herd Book, sired in Great Britain or Ireland	5	3	2
121.—Cow, in-Milk, calved before 1922	10	5	2
122.—Cow or HEIFER, in-Milk, calved in 1922	10	5	2
123.—HEIFER, in-Milk, calved in or since 1923	10	5	2
124.—BULL, calved before 1923	10	5	2
125.—BULL, calved in 1923	10	5	2
126.—BULL, calved in 1924	10	5	2

GUERNSEY.

Judge—C. RICHARDSON, Lynchmere Farm, Haslemere, Surrey

£20 towards the Prizes in the Guernsey Classes are contributed by the English Guernsey Cattle Society.

CLASS.	First Prize.	Second Prize.	Third Prize.
127.—Cow in-Milk, calved before 1922	£ 10	£ 5	£ 2
128.—HEIFER, in-Milk, calved in 1922	10	5	2
129.—HEIFER, calved in 1923	10	5	2
130.—HEIFER, calved in 1924	10	5	2
131.—BULL, calved in 1921 or 1922	10	5	2
132.—BULL, calved in 1923	10	5	2
133.—BULL, calved in 1924	10	5	2

SPECIAL PRIZE.

Offered by G. H. Johnstone, Esq., through the English Guernsey Cattle Society.

“The Trewithen Challenge Cup” for the Best Bull exhibited in the Guernsey Classes, whose dam and sire’s dam have qualified in accordance with the standard required for entry in the Advanced Register of the English Guernsey Cattle Society, both in milk and butter fat, or alternatively in either milk or butter fat with 30 per cent. above the requirements for entry. Only the official test of the English Guernsey Cattle Society, Royal Guernsey Agricultural Society, or the Ministry of Agriculture will be accepted. The Cup to be won three years in succession by the same exhibitor before becoming his absolute property.

KERRY.

Judge—E. P. F. SUTTON, Sidmouth Grange, Earley, Berks.

£15 of the Prizes in Classes 134 to 136 are contributed by the British Kerry Cattle Society.

134.—Cow or HEIFER, in milk, calved in or before 1922 ..	10	5	2
135.—HEIFER, not in milk, calved in 1923 or 1924 ..	10	5	2
136.—BULL, calved in 1922, 1923 or 1924.. ..	10	5	2

DEXTER.

Judge—E. P. F. SUTTON, Sidmouth Grange, Earley, Berks.

137.—Cow or HEIFER, in-Milk, calved in or before 1922 ..	10	5	2
138.—HEIFER, calved in 1923 or 1924	10	5	2
139.—BULL, calved in 1922, 1923 or 1924	10	5	2

The Prizes in Class 140 are offered by the Dexter Cattle Society.

140.—Bull, calved in 1924, whose sire and dam are entered in the English Dexter or Royal Dublin Society’s Herd Book	10	3	2
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SPECIAL PRIZE.

Offered by the Dexter Cattle Society.

The Devonshire Challenge Cup, for the Best Animal in Classes 137 to 140, bred by Exhibitor, and entered in or eligible for the Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.

The Certificate of Award of the Dexter Cattle Society will be given to the owner of the winning animal on each occasion the Cup is competed for.

	First Prize. £	Second Prize. £	Third Prize. £
<i>Animals entered in the Breed Classes can, if eligible, be entered also, on payment of an additional fee of 10/- for Members and 20/- for Non-Members, in Classes 141 to 145.</i>			

MILK RECORDED CATTLE.

Judge—

The Prizes in Class 141 are offered by the Kent County Agricultural Society.

CLASS.

141.—Ministry of Agriculture ear-marked cow of any breed, pedigree or non-pedigree, having given 8,000 lbs. of milk or over in any one milk recording year (i.e.. October 1 to October 1 in any year) or from April 1, 1924 to April 1, 1925, recorded in Kent and which has been owned by the exhibitor for a full year	10	5	3
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SPECIAL PRIZE.

Offered by Major the Hon. J. J. Astor through the Kent Milk Recording Society.

The "Hever Castle" Challenge Cup to the Kentish owner securing the highest position.

MILK TEST.

(See Regulation 62).

Judge—A. F. SOMERVILLE, Dinder House, Wells, Somt.

142.—Cow, in-Milk, of any breed or cross, under 950lbs. live weight, yielding the largest quantity of milk, of normal character, containing at each time of milking not less than 3 per cent. fat, the period of lactation being taken into consideration	10	5	2
143.—Cow, in-Milk, of any breed or cross, 950lbs. live weight or over, ditto, ditto	10	5	2

SPECIAL PRIZE.

Offered by the British Friesian Cattle Society to the owner of the Cow awarded the greatest number of points in Classes 142 and 143, provided that such Cow is a British Friesian.

50

BUTTER TEST.

(See Regulation 62.)

Judge—A. F. SOMERVILLE, Dinder House, Wells, Somt.

144.—Cow, of any breed or cross, under 950lbs. live weight, obtaining the greatest number of points by the practical test of the separator and churn	5	3	2
145.—Cow, of any breed or cross, 950lbs. live weight and over, ditto, ditto	5	3	2

BUTTER-TEST—continued.

SPECIAL PRIZES.

Offered by the respective Breed Societies.

- | | |
|---|------------------------------------|
| For the South Devon Cow obtaining the best results .. | 25 5s. |
| For the British Friesian Cow obtaining the best results .. | 25 |
| For the Red Poll Cow obtaining the best results .. | 25 |
| For the three Jersey Cows obtaining the best results and
not less than 42 points | Gold, Silver and
Bronze Medals. |
- (Certificates of Merit will also be awarded to Jersey Cows, 4 years old
and under, obtaining 30 points, and Cows over 5 years old, obtaining
35 points.)
- | | |
|--|----|
| For the Guernsey Cow obtaining the best results .. | 25 |
|--|----|

CHALLENGE CUP.

Offered by R. Bruce Ward, Esq., to the Member of the Kent Milk
Recording Society whose animal secures the highest position
in Class 144 or 145.

SHEEP.

Entry Fees : Members, 15/- ; Non-Members, 30/- each entry.

DEVON LONGWOOLLED.

Judge—E. LAWRENCE, Veryards, Cullompton, Devon.

£10 towards the prizes in these Classes are contributed by the Devon Longwoolled Sheep Breeders' Society.

CLASS.	First Prize. £	Second Prize. £	Third Prize. £
146.—Shearling RAM	10	5	2
147.—Pen of three Shearling EWES	10	5	2

KENT OR ROMNEY MARSH.

Judge—H. T. GREENSTED, Chequer Court, Ash, via Canterbury.

£80 towards the Prizes in these Classes are offered by the Kent or Romney Marsh Sheep Breeders' Association.

148.—Two Shear RAM	10	5	2
149.—Shearling RAM	10	5	4
	Fourth £3, Fifth £2		
150.—Pen of five Sherling RAMS	10	5	3
	Fourth £2		
151.—Pen of three RAM LAMBS, dropped in 1925	10	5	2
152.—Pen of three Shearling EWES	10	5	2
153.—Pen of three EWE LAMBS, dropped in 1925	10	5	2

CHAMPION PRIZES.

Offered by the Kent County Agricultural Society.

Best Ram or Ram Lamb in Classes 148 to 151.	10
Best Ewe or Ewe Lamb in Classes 152 or 153.	10

SOUTHDOWN.

Judge—E. W. AMOS, Wey Street, Hernhill, Faversham.

£17 towards the Prizes in these Classes are offered by the Southdown Sheep Society.

154.—Two Shear Ram	10	5	2
155.—Shearling RAM	10	5	2
156.—Pen of three Shearling EWES	10	5	2

SPECIAL PRIZE.

Offered by the Southdown Sheep Society, under Condition 65, subject to there being at least three competitors.

Silver Medal or £1 for the best Ram in Classes 154 and 155.

First Prize. £	Second Prize. £	Third Prize. £
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HAMPSHIRE DOWN.

Judge—E. T. JUDD, Four Winds, Compton, Winchester.

£15 towards the Prizes in these Classes and the Champion Prize are offered by the Hampshire Down Sheep Breeders' Association.

157.—Shearling RAM	10	5	2
158.—RAM LAMB, dropped in 1925	7	5	2
159.—Pair of RAM LAMBS, dropped in 1925	10	5	2
160.—Pen of three Shearling EWES	10	5	2

CHAMPION PRIZE.

Best Ram, Ram Lamb, Pair or Pen, in Classes 157 to 160 .. 5

OXFORD DOWN.

Judge—W. D. LITTLE, The Hermitage, Eddington, Hungerford, Berks.

CLASS.

161.—Shearling RAM	10	5	2
162.—Pair of RAM LAMBS, dropped in 1925	10	5	2
163.—Pen of three Shearling EWES	10	5	2

The Prizes in Class 164 are offered by the Oxford Down Sheep Breeders' Association, and will be withheld until the Animals awarded the Prizes are registered in the Flock Book.

164.—Pen of three Ewe Lambs, dropped in 1925	6	3	1
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DORSET HORN.

Judge—G. MAYO, Coker's Frome, Dorchester, Dorset.

The Animals entered in Classes 165 and 167 must have been shorn bare in the year of the Show.

£15 towards the Prizes in Classes 165 to 168 are contributed by the Dorset Horn Sheep Breeders' Association

165.—Shearling RAM	10	5	2
166.—Pair of RAM LAMBS, dropped after November 1st, 1924	10	5	2
167.—Pen of three Shearling EWES	10	5	2
168.—Pen of three EWE LAMBS, dropped after November 1, 1924	10	5	2

DORSET DOWN.

Judge—W. W. LOVELACE, Piddleshinton, Dorchester.

£15 towards the Prizes in these Classes and the Champion Prize are contributed by the Dorset Down Sheep Breeders' Association.

169.—SHEARLING RAM	10	5	2
170.—Pair of RAM LAMBS, dropped in 1925	10	5	2
171.—Pen of three SHEARLING EWES	10	5	2

CHAMPION PRIZE.

Best Ram, Pair or Pen, in the Dorset Down Classes .. 5

First Prize. £	Second Prize. £	Third Prize. £
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SUFFOLK.

Judge—F. M. L. SLATER. Weston Colville, Cambs.

£25 towards the Prizes in these Classes are contributed by the Suffolk Sheep Society.

CLASS.

172.—Shearling RAM	10	5	2
173.—Pair of RAM LAMBS, dropped in 1925	10	5	2
174.—Pen of three Shearling EWES	10	5	2
175.—Pen of three EWE LAMBS, dropped in 1925.. .. .	10	5	2

CHAMPION PRIZE.

Offered by Sir F. Hervey Bathurst, Bart., D.S.O.

A Silver Cup for the best Ram, Pair or Pen, in the Suffolk Classes. The Cup to be won three years in succession before becoming the absolute property of the winner.

RYELAND.

Judge—F. T. GOUGH, Lugwardine, Herefordshire.

£15 of the Prizes in these Classes are offered by the Ryeland Sheep Society.

176.—RAM, 2 Shear and upwards	10	5	2
177.—Shearling RAM.. .. .	10	5	2
178.—Pair of RAM LAMBS, dropped in 1925	10	5	2
179.—Pen of three Shearling EWES	10	5	2

KERRY HILL.

Judge—A. M. PUGH, The Grove, Knighton, Radnorshire.

£12 towards the Prizes in Classes 180 to 182 are contributed by the Kerry Hill (Wales) Flock Book Society, and animals must be shown uncoloured; the names and Flock Book Number of Rams must be given and in Class 182 the Ewes must be bred from one Flock and the Breeder's name must be given.

180.—RAM, 2 Shear and upwards	10	5	2
181.—Shearling RAM	10	5	2
182.—Pen of three Shearling EWES	10	5	2

CHAMPION PRIZE.

Offered by H.R.H. The Prince of Wales, K.G.

A Challenge Cup, value £20, for the best animal exhibited in Class 181 or 182 to be won three times in succession or four times altogether before becoming the property of the Exhibitor.

GOATS.

(For Regulations see Entry Forms).

Entry Fees : Members, 7/6 ; Non-Members 10/- each entry.**Judge—S. WOODIWISS, Graveleys, Great Waltham, near Chelmsford.**

£145s. 0d. towards the Prizes in these Classes are contributed through the British Goat Society.		First Prize.	Second Prize.	Third Prize.
CLASS.		£ s.	£ s.	s. d.
183.—FEMALE GOAT, in-milk, any age, Toggenburg, British Toggenburg, British Alpine, Saanen, or British Saanen	2 10	1 10	15	0
184.—FEMALE GOAT, in-Milk, any age. Any other variety	2 10	1 10	15	0
185.—GOATLING.—Any variety, over one year, but not exceeding two years	2 10	1 10	15	0
186.—MALE GOAT. Any variety, over one year, but not exceeding two years	2 10	1 10	15	0
187.—MALE GOAT. Any variety, over two years	2 10	1 10	15	0
188.—MILKING COMPETITION, for quantity and time only (three milkings)	2 10	1 10	15	0

Special Prizes offered by the British Goat Society.

A Challenge Certificate for the Best Female Goat over two years that has borne a kid.**A Challenge Certificate for the Best Dual Purpose Goat over two years that has borne a kid.****A Challenge Certificate for the Best Male Goat over one year.****A Bronze Medal for the Best Female exhibit.**

The Prizes awarded at this Show will also be included in the awards for the British Goat Society's "Breeder's" Perpetual Challenge Cup and "Stud Goat" Challenge Cup.

PIGS.**Entry Fees : Members, 15/- ; Non-Members, 30/- each entry.****BERKSHIRE.****Judge—J. FRICKER, Marsh Farm, Stalbridge, Dorset.**

£9 towards the Prizes in these Classes are contributed by the British Berkshire Society, and ages are calculated to May 23, 1925.

CLASS.	£	£	£
189.—BOAR, exceeding 18 months old	10	5	2
190.—BOAR, not exceeding 18 months old	7	4	2
191.—Breeding Sow, exceeding 18 months old	10	5	2
192.—Breeding Sow, not exceeding 18 months old	7	4	2

CHALLENGE CUPS (Value £10 10s. each).

Offered by the British Berkshire Pig Society.

To be won twice in succession or three times in all before becoming the property of the Exhibitor.

Best Boar in Classes 189 or 190.**Best Sow in Classes 191 or 192.****A Silver Medal will be awarded to the Breeder of the prize-winning Animals.**

Prizes for Pigs for 1925.

cli

First Prize.	Second Prize.	Third Prize.
£	£	£

LARGE BLACK.

Judge—W. KITTOW, Jun., Bancroft, Cottered, Buntingford, Herts.

£40 towards the prizes in these Classes and the Champion Prizes are contributed by the Large Black Pig Society.

CLASS.

193.—BOAR, farrowed before May 1, 1924	10	5	2
194.—BOAR, not exceeding 12 months old on May 1, 1925	10	5	2
195.—BOAR, farrowed in 1925	7	4	2
196.—BREEDING Sow, farrowed before May 1, 1924	10	5	2
197.—BREEDING Sow, not exceeding 12 months old on May 1, 1925	10	5	2
198.—Pair of BREEDING Sows, farrowed in 1925	7	4	2

CHAMPION PRIZES.

Best Animal in Classes 193 to 195	Silver Medal
Best Animal in Classes 196 to 198	Silver Medal.

LARGE WHITE.

Judge—H. W. BISHOP, Pendley Stock Farms, Tring.

£10 towards the prizes in these Classes and the Champion Prize are offered by the National Pig Breeders' Association.

199.—BOAR, farrowed before 1925	10	5	2
200.—BOAR, farrowed in 1925	7	4	2
201.—BREEDING Sow, farrowed before 1925	10	5	2
202.—Pair of BREEDING Sows, farrowed in 1925	7	4	2

CHAMPION PRIZE.

A GOLD MEDAL or £5 for the Best Animal in Classes 199 to 202.

MIDDLE WHITE.

Judge—W. W. BUCKLE, Wharfedale Cottage, Middlethorpe, York.

£15 towards the Prizes in these Classes and the Champion Prizes are offered by the National Pig Breeders' Association.

203.—BOAR, farrowed before 1925	10	5	2
204.—BOAR, farrowed in 1925	7	4	2
205.—Breeding Sow, farrowed before 1924	10	5	2
206.—Breeding Sow, farrowed in 1924	7	4	2
207.—Pair of Breeding Sows, farrowed in 1925	7	4	2

CHAMPION PRIZES.

A GOLD MEDAL or £5 for the Best Animal in Class 203 or 204.	
Do. Do. Classes 205 to 207	

TAMWORTH.

Judge—H. W. BISHOP, Pendley Stock Farms, Tring.

£10 towards the Prizes in these Classes and the Champion Prize are contributed by the National Pig Breeders' Association.

208.—BOAR, any age	10	5	2
209.—Breeding Sow, farrowed before 1925	10	5	2
210.—Pair of Breeding Sows, farrowed in 1925	7	4	2

CHAMPION PRIZE.

A Gold Medal or £5 for the best animals in Classes 208 to 210

GLOUCESTERSHIRE OLD SPOTS.

Judge—W. NIXON, Offchurch, Leamington Spa, Warwickshire.

£20 towards the Prizes in these Classes are contributed by the Gloucestershire Old Spots Pig Society.

CLASS.

	First Prize. £	Second Prize. £	Third Prize. £
211.—BOAR, farrowed before 1925.. .. .	10	5	2
212.—BOAR, farrowed in 1925	7	4	2
213.—Breeding Sow, farrowed before 1924	10	5	2
214.—Breeding Sow, farrowed in 1924	10	5	2
215.—Pair of BREEDING SOWS, farrowed in 1925.. .. .	7	4	2

CHAMPION PRIZES.

Offered through the Gloucestershire Old Spots Pig Society.

The Sir George Watson Challenge Cup, value £21, for the best Animal in Classes 211 to 215. (The Cup to be won three times by the same Exhibitor with different animals before becoming his own property).

The Deane-Drummond Cup, value £14 14s. for the best Boar in Class 211 or 212. (The Cup to be won twice by the same exhibitor with different animals before becoming his own property).

The Sir John Anderson Challenge Cup for the best Sow in Classes 213 to 215. The Cup to be won twice by the same Exhibitor with different animals before becoming his own property.

WESSEX SADDLEBACK.

Judge—L. L. BATTEN, Glenjoyce, East Wellow, Romsey.

£24 towards the Prizes in these Classes and the Special Prizes are offered by the Wessex Saddleback Pig Society, and all pigs exhibited must be entered or eligible for entry in that Society's Herd Book.

CLASS.

	10	5	2
216.—BOAR, farrowed before 1925.. .. .	10	5	2
217.—BOAR, farrowed in 1925	7	4	2
218.—Breeding Sow, farrowed before 1924	10	5	2
219.—Breeding Sow, farrowed in 1924	10	5	2
220.—Pair of Breeding Sows, farrowed in 1925	7	4	2

GOLD MEDAL.

Value £5 5s. for the best Pig exhibited in Classes 216 to 219, and a Silver Medal to the Breeder who is not the exhibitor of the Animal winning the Gold Medal.

LONG WHITE LOP-EARED.

Judge—H. J. KINGWELL, Bow Grange, Totnes, Devon.

£20 towards the Prizes in these Classes are contributed by the Long White Lop-Eared Pig Society.

	10	5	2
221.—BOAR, farrowed on or before October 1, 1924	10	5	2
222.—BOAR, farrowed since October 1, 1924	7	4	2
223.—Sow, any age, in farrow, or with farrow not exceeding 8 weeks old on 1st day of Show	10	5	2
224.—Sow, farrowed since March 1st, 1924	7	4	2
225.—Pair of BREEDING SOWS, farrowed in 1925	7	4	2

BACON PIGS.

Judge—R. P. REDMAN, c/o Messrs. C. & T. Harris (Ld.), Calne, Wilts.

226.—Pair of PIGS of any breed or first cross (the cross to be stated), best suitable for the Wiltshire cut of Bacon	7	4	2
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PRODUCE.

First Prize. £	Second Prize. £	Third Prize £
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CIDER.

(Open to Growers or Makers).

Entry Fees : Members, 3, 6 : Non-Members, 6/- each entry.

Judge—G. H. HOLLINGWORTH, Shire Hall, Gloucester.

Cider entered in the Novice Class can also be entered in the Open Class for which it is eligible.

CLASS

227.—NOVICE CLASS. Cask of not less than 9 and not more than 30 gallons of CIDER made in 1924 by an Exhibitor who has not previously taken a first prize in any public exhibition	5	3	2
228.—Cask of not less than 9 and not more than 30 gallons of CIDER, made in 1924, of a specific gravity not exceeding 1.015 at 60 deg. Fahr.	5	3	2
229.—12 Quart Bottles of CIDER, made in 1924, ditto ..	5	3	2
230.—Cask of not less than 9 and not more than 30 gallons of CIDER, made in 1924	5	3	2
231.—12 Quart Bottles of CIDER, made in 1924	5	3	2

The First Prize in Class 23 is offered by Lord Bledisloe.

232.—12 Quart Bottles of CIDER, made in any year, of a specific gravity not exceeding 1,005 at 60 deg. Fahr.	5	3	2
233.—12 Quart Bottles of CIDER, made in any year previous to 1924	5	3	2

HOPS.

Of the growth of 1924.

Offered by the Maidstone Local Committee.

Judges—Messrs. WILD, WEAVER & Co., 33 Borough High Street, London and J. H. MATTHEWS & Co., 52 Borough High Street, London.

CLASS

234.—Sample of East Kent Hops	10	5
235.—Sample of Mid-Kent Hops	10	5
236.—Sample of Weald of Kent Hops	10	5
237.—Sample of Sussex Hops	10	5

Champion Prize—Best Sample of Hops in any of the Classes 20

	First Prize	Second Prize	Third Prize
	£ s.	£ s.	£ s.
CHEESE.			
Entry Fees : Class 238. Members, 10/- ; Non-Members, 20/- . Classes 239 to 241 : Members, 7/6 ; Non-Members, 15/-.			
Judge—J. R. ALLEN, Highfield, Shepton Mallet.			
CLASS.			
238.—Three Cheddar CHEESES (not less than 56lbs. each) made in 1924	15 0	10 0	5 0
239.—Three Cheddar CHEESES (not over 56lbs. each), made in 1924	10 0	7 0	4 0
240.—Four Loaf or other Truckle CHEESES, made in 1924	5 0	3 0	2 0
241.—Three Caerphilly CHEESES, made in 1925	5 0	3 0	2 0

CREAM CHEESE, BUTTER AND CREAM.

(These Classes are not open to Professional Teachers.)

Entry Fees : Members, 3/6 ; Non-Members, 6/-

Judge—Miss M. C. TAYLOR, Somerset Farm Institute, Cannington Court, Bridgwater.

	First Prize.	Second Prize.	Third Prize.	Fourth Prize.
	£ s.	£ s.	£ s.	£ s.
CLASS.				
242.—Three Cream or other Soft CHEESES ..	3 0	2 0	1 0	0 10
243.—2lbs. of Fresh (or very slightly salted) BUTTER	4 0	3 0	2 0	1 0
244.—2lbs. of BUTTER, in the making of which no salt has been used, to be judged on the last day of the Show	4 0	3 0	2 0	1 0
245.—12lbs. of Keeping BUTTER, in a jar or crock, to be delivered to the Secretary 4 weeks before the Show	5 0	4 0	3 0	2 0
246.—Four half-pounds of SCALDED CREAM ..	3 0	2 0	1 0	

COMPETITIONS.

BUTTER-MAKING.

(No Winner of a first prize given by this Society for Butter-making during the last 3 years is eligible to compete in Classes 247 to 249.)

Entry Fees : Members, 3/6 ; Non-Members, 6/-.

Judge—Mrs. S. E. STEVENS, Grove Farm, Emmer Green, Reading.

(For Conditions and Regulations see Entry Form.)

CLASS.	First Prize. £ s.	Second Prize. £ s.	Third Prize. £ s.	Fourth Prize. £ s.
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- 247.—NOVICE CLASS. For Competitors who have not hitherto won a prize for Butter-making at the London Dairy Show or the Shows of the Royal Agricultural or Bath and West Society. On the 1st day of the Show 4 0 3 0 1 10 1 0
- 248.—For Men and Women, bona fide workers on a farm. On the 2nd day of the Show 4 0 3 0 1 10 1 0
- 249.—For Students who have been through a course of instruction in Butter-making at any County Council School, and who have not previously won a first or second prize at one of the Society's Shows. On the 3rd day of the Show 4 0 3 0 1 10 1 0
- 250.—For Men and Women. On the 4th day of Show 4 0 3 0 1 10 1 0
- 251.—For Winners of First and Second Prizes in the Butter-making Classes 247 to 251, or at any previous meeting of the Society. On the 5th day of the Show.
1st Prize, Gold Medal.
2nd „ Silver Medal.
3rd „ Bronze Medal.

MILKING.

Entry Fees : 2/6 each entry.

Judge—J. MACINTOSH, National Institute for Research in Dairying, Shinfield, Reading.

- 252.—For Men, 16 years of age and over .. 2 0 1 0 0 15
- 253.—For Women, 16 years of age and over .. 2 0 1 0 0 15
- 254.—For Boys and Girls under 16 years of age .. 1 10 1 0 0 15 0 10

SHOEING.

Entry Fees : Members, 3/6 ; Non-Members, 6/- each entry.

Judge—J. C. COLEMAN, M.R.C.V.S., The Limes, Croft Road, Swindon.

- 255.—For CART HORSE SHOEING by Smiths. On the 2nd day of the Show 4 0 3 0 2 0 1 0

SHOEING—continued.

			First Prize.	Second Prize.	Third Prize.	Fourth Prize.		
			£	s.	£	s.	£	s.
256.—For NAG HORSE SHOEING by Smiths. On			4	0	3	0	2	0
the 3rd day of the Show							1	0
257.—For Hunter Shoeing by Smiths. On the 4th			4	0	3	0	2	0
day of the Show							1	0
258.—For SHOE MAKING or TURNING by Smiths,								
the patterns and descriptions of the Shoes								
to be supplied by the Judge. On the 5th								
day of the Show			4	0	3	0	1	0
							0	10

SPECIAL LOCAL PRIZES.

Offered by the Kent County Council.

Best Competitors in Class 255 resident in Kent ..	3	0	2	0	1	0
Best Competitors in Class 256 resident in Kent ..	3	0	2	0	1	0
Best Competitors in Class 258 resident in Kent ..	3	0	2	0	1	0

CONDITIONS AND REGULATIONS FOR LIVE STOCK.

GENERAL.

ENTRIES.

1. The following are the Fees payable for Stock entries made on or before April 2. After that date and up to April 9, entries (except in the Any Agricultural, Remount, Saddle, Harness and Jumping Classes) will only be received on payment, in each case, of double the fee named below. *Exhibitors are requested to note that no exception can be made to this.* The entry fee is not returnable to an Exhibitor who enters an Animal in a Class for which it is ineligible, or for entries that are withdrawn after the date of entry has expired.

MEMBERS. NON-MEMBERS.
(see Reg. 4 below)

Shire Horses, Percherons, Suffolk and Hunters for each entry, including			
Horse Box	25s.	50s.	
Arabs and Ponies, including Box	10s.	10s.	
Any Agricultural Horses, Remount, Saddle, Harness and Jumping, without Box			
for each Entry	5s.	10s.	
Ditto, with Box	25s.	50s.	
Cattle	17s. 6d.	35s.	
Nurse Cows	40s.	40s.	
Sheep and Pigs	15s.	30s.	
Goats	7s. 6d.	10s.	

For particulars as to fees in the Produce, Butter-making, Milking, Shoeing and Poultry Classes, see Entry forms.

2. Animals entered in the Any Agricultural, Remount, Saddle, Harness and Jumping Classes, and not having a box in the Yard, must be in the Yard by the time stated on the day on which they compete, and, with the consent of the Stewards may leave the Yard as soon as they have been judged. Entries in these Classes, if no Box is required, must reach the Secretary not later than 12 noon on the day previous to the competition for which the animal is entered. If a Box is required the entry must reach the Secretary on or before April 2, or at double fees as stated above, by April 9.

3. No Entry will be received unless the fee accompanies it, and (if the Exhibitor is a Member of the Society) the subscription for the year, unless previously paid, together with any arrears that may be due.

4. The privilege of entering at Members' fees is strictly limited to members of the Society, or of the Kent County Agricultural Society, elected on or before January 31, 1925, and subscribing not less than £1 annually, or if elected after that date who has paid his subscription for 1925 and an additional £1 before the date of the closing of entries.

5. Where a Prize is offered for a *pair* or *pen* of Animals, single entry fees only are payable for each *pair* or *pen*, and only one entry form must be used.

6. Exhibitors desiring to send a nurse cow with their exhibits must give notice at the time of making their entry.

7. All Entries must be made on the printed forms to be obtained of the Secretary (F. Holland Storr, 3, Pierrepont Street, Bath), and, in applying for Forms, Exhibitors are requested to state how many entries they wish to make of either Horses, Cattle, Sheep, Goats or Pigs, as a separate entry form must be filled up for each animal entered in a separate class.

9. Every Exhibitor or Competitor is requested to carefully examine the List of Prizes and Conditions, as he will be held responsible for the correctness of his Certificate of Entry. An Exhibitor omitting to give information asked for on the entry form, with regard to the age, breeder, name, colour, sire, dam, &c., of an animal, will be liable to have his entry disqualified, and, if an exhibitor desires that his animal shall compete for any special prize offered, he must notify this on the entry form where requested to do so.

9. If an Exhibitor or Competitor fails, when called upon by the Stewards or Council, to prove the correctness of his Certificate of Entry to their satisfaction, the Entry may be disqualified and any award made to it cancelled.

10. An Exhibitor who has made, in due time, an entry of Horses, Cattle, Sheep, Goats or Pigs, in a particular class, will be permitted, up to Wednesday, April 22. to withdraw the entry of such animal, and to substitute for it the entry of another animal in the same class, on payment of the difference, if any, between the amount of the entry fee originally paid for the animal withdrawn, and the post entry fee. When, after entry, an animal dies, the exhibitor will be permitted to substitute another entry for it, in the same class, without payment of any further fee, upon affording evidence of death and furnishing particulars of the substituted entry in time for the alteration to be made in the published catalogue.

11. An animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of Special or Champion Prizes for exhibits already entered in any particular Class.

12. Every exhibit must be the *bona fide* property of the Exhibitor both at the time of entry and on the first day of the Exhibition. For the purposes of this Meeting H.M. Officer's chargers will be considered as the property of the Officer in Classes 53 to 62.

SHOW YARD.

13. The Yard will be open for the reception of Horses (see Regulation 2 for Any Agricultural, Remount, Saddle, Harness and Jumping Horses), Cattle, Sheep, Goats and Pigs, on Tuesday and Wednesday, May 26 and 27, from 7 a.m. to 6 p.m. Shire, Percheron and Suffolk Horses and Hunters will also be received from 6 to 8 o'clock on the morning of the first day of Show, but all other Stock Entries (except Arabs and Ponies, which must be in the Yard before the time stated on Monday, June 1), must be in the Yard the previous day. A label denoting the number of each entry will be sent by the Secretary, and must be securely affixed to the head of the Animal. The carriage of exhibits must in all cases be paid by the Exhibitor. No exhibit subject to charges will be received by Officers of the Society.

14. If an animal is brought into the Show Yard without having been entered for exhibition, the owner shall be liable to a fine of £2 and to the forfeiture of any prize awarded to him or her.

15. All Live Stock (see Conditions 2, 13 and 38 for exceptions with regard to Horses) must remain in their places in the Show Yard until after six o'clock in the afternoon of the last day of the Show, and shall under no circumstances be taken out of their places in the interval without the special permission of the Stewards.

16. During the time the Show is open to the public no rug or cloth shall be hung up so as to conceal any animal in a horse-box or stall, except with the special permission of the Steward of the department. All sheets used for the purpose must be removed before 9 o'clock on each day the exhibition is open to the public, and must not be replaced until after the closing hour of the Show each day.

17. All Exhibits and all persons in charge of the same, will be subject to the Orders, Regulations, and Rules of the Society, and the Stewards shall have the power to remove from the Yard the Stock or property belonging to, and to cancel the admission ticket of, any Exhibitor who shall infringe any of the Regulations or Conditions of the Meeting, or who shall refuse to comply with any instructions given by the Stewards, without any responsibility attaching to the Stewards or the Society in consequence of such removal.

18. No animal shall be decorated with colours other than the Society's Prize Rosettes.

19. No person shall be allowed to fix any placard, or to take down any official placard, in the Yard, without the written permission of the Stewards.

20. All persons in charge of Exhibits will be subject to the orders of the Stewards, and will be required to parade or exhibit the animals in their charge at such times as may be directed by the Stewards. Servants must be in attendance each day during the Show at least a quarter of an hour before the time appointed for exhibiting the animals under their charge in the Show rings. Servants in charge of animals must see that the animals' boxes or stalls are kept clean. No oil or cooking stove of any description must be lighted in the Horse Boxes and any one found offending in this respect will be dealt with in accordance with Regulation 33. Owners of animals exhibited will be held responsible for the behaviour of their Servants, and for the consequences of any misconduct of such Servants.

21. Servants in charge of Stock at night must, if they leave the yard, return before 10 p.m., or they will not be admitted.

22. On the day previous to the opening and on each day of the Show hay or green food and straw will be supplied by the Society free of expense to exhibitors at the Forage Stores in the Show Yard. Servants must apply at the Forage Stores for their Forage Tickets after they have brought their animals into the Yard. Corn, meal, and cake can be obtained in the Show Yard at fixed prices.

NOTE.—For the convenience of Exhibitors wishing to sell their animals, a Register will be kept at the Secretary's Office, in which they may enter the prices.

TICKETS.

23. Each Exhibitor of Live Stock whose entry fees amount to £1 and upwards will have a Free Ticket of admission to the Show Yard sent to him, except in the case of a Member, who will receive his Member's Badge in lieu of an Exhibitor's Ticket. Tickets for the use of Servants in charge of Live Stock remaining in the Yard will also be sent, and the Exhibitor will be held responsible for the proper use of such Tickets. In the case of animals not having a box in the Yard, a Servant's Ticket will not be required as the official label will admit the Driver or Rider, Horse and Vehicle into the Yard. In case of transfer or other improper use of a Ticket the Exhibitor will be required to pay a fine of £1 for each case. Exhibitors will be held responsible for the attendance at each Parade of as many Servants as Tickets have been issued for.

RESPONSIBILITY.

24. Neither the Society nor any of its Officers or Servants shall be in any way responsible or accountable for anything that may happen (from any cause or circumstance whatever) to Exhibitors or their Servants, or to any animal or article exhibited, or property brought into the Show Yard, or otherwise for anything else in connection with, or arising out of, or attributable to, the Society's Show, or these or any other Conditions or Regulations prescribed by the Society in relation thereto.

25. Each Exhibitor shall be solely responsible for any consequential or other loss, injury, or damage done to, or occasioned by, or arising from, any animal or article exhibited by him, and shall indemnify the Society against all legal or other proceedings in regard thereto.

26. The Society, its Officers and Servants, will not be liable for any errors or mistakes that may happen in placing or penning the Stock or Articles to be exhibited, but the Servants in charge of the same must see that they are placed or penned according to their entries.

DISQUALIFICATION.

27. The use of resin, soap, sawdust above the knee, or other substances designed to give an artificial appearance; cording; or other improper means adopted in showing an animal in the Agricultural Horse Classes will be regarded as a disqualification.

28. No animal which has been exhibited as Fat Stock at any Show shall be eligible to compete for the Prizes offered in this Prize Sheet.

29.—An animal in the Breeding Classes having any unsoundness likely to be transmitted to its progeny shall be disqualified thereby from receiving any Prize offered by or through the Society.

30. If it shall be proved to the satisfaction of the Stewards or Council that an Exhibitor or Competitor has knowingly signed an incorrect Certificate, or knowingly given an incorrect Pedigree of any animal, or has attempted to enter an animal or other exhibit or to obtain a Prize by any other unfair means at this or any other Agricultural Society's Meetings, or is under exclusion from any Breed Society for fraudulent practices, the Council shall have the power to cancel all awards made to such Exhibitor or Competitor, to disqualify him or her from exhibiting or competing at future Meetings of the Society, and to inform other Agricultural Associations of their action in this respect.

PENALTIES.

31. As the non-exhibition of animals entered for the Show causes unnecessary preparations and expense, and disarranges the Show Yard, any person entering Stock, and failing to exhibit the same, shall pay a penalty of 10s. for each entry, unless a Certificate, under the hand of the Exhibitor or his authorised agent, be lodged with the Secretary of the Society, before the day of exhibition, certifying that such non-exhibition is caused either by—(1) the death of the animal or animals; or (2) contagious or infectious disease (confirmed by the explanatory certificate of a Veterinary Surgeon) or other sufficient cause; or (3) by its becoming ineligible for the Class in which it has been entered. The fine is not remitted in the case of an exhibitor selling an animal between the time of entry and the date of the Show.

32. Every Exhibitor will be required to undertake to forfeit and pay to the Society the sum of £20, as and for liquidated damages, if any animal which he exhibits be, to his knowledge, suffering from any contagious or infectious disease, and the Stewards are empowered to prevent the entry of any diseased animal into the Yard, or to have it removed therefrom.

33. Any infringement of any of these or any other prescribed Regulations or Conditions will subject the Exhibitor to a fine of £1 by the Stewards, and to the forfeiture, by order of the Council, of any prize to which he may be entitled (in addition to all other consequences attaching to such infringement). The Council reserves to itself the right to inform other Agricultural Associations of any decision it may come to with respect to an Exhibitor.

AWARDS.

34. The Society reserves to itself the right to withhold any prize, if, in the opinion of the Stewards, the conditions and regulations have not been properly complied with, or if, in the opinion of the Judge, there is insufficient merit.

35. Only the signed awards of the Judges are accepted by the Society as evidence that a prize has been awarded, and the production of the prize card or the rosette by an Exhibitor will not entitle him to the prize.

36. The certificate of the Veterinary Inspector, whether as to age or soundness, shall be required only in cases where the Judges are in doubt, or where the Stewards may consider it necessary. (See also Regulation 46 with reference to Stallions and Mares.) The decision of the Inspector in such cases shall be final and conclusive; and in case it shall be against the animal to which a Prize has been awarded, such animal shall be disqualified from receiving such Prize.

PROTESTS.

37. Any Exhibitor wishing to lodge a protest having reference to Live Stock exhibited at this meeting must make the same in writing on a form to be obtained from the Secretary, and deposit with him the sum of £3. If on investigation the protest is not sustained to the satisfaction of the Stewards, the sum thus deposited shall, at the discretion of the Council, be forfeited to the funds of the Society. All protests (except in the Any Agricultural, Remount, Saddle, Harness or Jumping Classes) must be delivered at the Secretary's Office in the Show Yard on the day on which the award is made, and no protest will be SUBSEQUENTLY received, unless a reason satisfactory to the Stewards be assigned for the delay. Any protest against an award in the Any Agricultural, Remount, Saddle, Harness or Jumping Classes must be made to the Steward in the ring immediately after the judging of the class to which it refers, and a deposit of £3 must, at the same time, be handed to the Steward. The Stewards will consider such protests at 11 o'clock on the following day at the Secretary's Office, at which time and place any person making a protest must attend or be represented by his authorised agent. The decision of the Stewards shall be final.

APPLYING TO CERTAIN CLASSES ONLY.

HORSES.

38. Horses can be removed from the Yard at night on deposit by the Exhibitor of £3 at the Finance Office, which sum will be forfeited if the Horse does not return at 8 a.m. each day during the Exhibition. This regulation does not apply to Animals not having a box in the Yard entered in the Any Agricultural, Remount, Saddle, Harness and Jumping Classes only.

39. Exhibitors must provide saddles for Horses in Classes 20 to 24, 32, 33, 34, 40, 53 to 61, as they are to be ridden; and vehicles and harness for those in classes 41 to 52, which are to be driven.

40. No Horse, unless a Foal, will be admitted into the ring without a proper bit.

41. The Prizes for Stallions foaled before 1923 will be withheld until a certificate from the owner is delivered to the Secretary that the Horse has served at least 10 Mares during the current season.

42. All Foals must be the offspring of the Mares with which they are exhibited, and the name of the Sire of the Foal must be stated on the certificate of entry.

43. Mares entered as in Foal shall, except as otherwise stated hereafter, be certified to have produced a living Foal before August 1st of the year of the Show. If the required certificate, which must be on a form obtainable from the Secretary, is not received by September 30, 1925, the prize awarded will be forfeited.

44. Horses may, at the discretion of the Stewards, be measured, and the measurement shall be taken in the shoes worn by the entry at the time of judging, and these shoes shall not be removed to allow of the entry being shown in another class.

45. In the Harness Classes for Hackneys exceeding 14 hands (except yearling colts and fillies) no shoe (nails included) may exceed 2 lbs. in weight, and for Ponies not exceeding 14 hands, yearling colts and yearling fillies, no shoe (nails included) may exceed 1½ lbs. in weight.

46. All Stallions and Mares (yearlings and foals excepted) to which prizes have been awarded in the breeding classes shall be examined by the Society's Veterinary Inspector, and unless pronounced free from indications of hereditary disease shall be ineligible to receive the prize. The owner of an Animal rejected under this Regulation may, upon his application in writing to the Secretary, be furnished with a copy of the Veterinary Certificate. This Regulation shall not, however, apply to any animal holding a Ministry of Agriculture Certificate for the current year, which must accompany the animal and be available for inspection by officers of the Society.

47. The following special conditions apply only to the Medal offered by the Shire Horse Society, viz.: the owner of the animal entered to have been a Member of the Bath and West and Southern Counties Society, for not less than six months previous to March 31, 1925; a Mare five years old, or upwards must produce a Foal in the current year, or have had a Foal in the preceding year; in the case of in-foal Mares a certificate of foaling must be lodged with the Secretary of the Shire Horse Society before the medal will be despatched. No animal to compete which has won the Shire Horse Society's Gold Medal during the current year; the Royal and London Shows being excepted; the winning animal to be entered, or eligible for entry, in the Shire Horse Society's Stud Book; and a certificate that the winner is free from hereditary disease signed by the Society's Veterinary Inspector after his examination on the Show Ground, must be lodged with the Secretary of the Shire Horse Society, but Stallions licensed by the Ministry of Agriculture, and Stallions, Mares and Fillies passed at the London Show, shall be exempt from further examination when selected for Medals during the current year. A prize of £5 will also be awarded to the breeder of the animal winning the Medal, provided that he is a member of the Shire Horse Society, and that the Dam is a Mare registered in the Shire Horse Stud Book. All awards must be completed within six months of the date upon which the Medal was awarded, or they will be void. The Council reserves the right to award the prizes only to persons approved by the Shire Horse Society and subject to confirmation in the uncontrolled discretion of the Council.

48. The following special conditions apply only to the Medal offered by the Hunters' Improvement and National Light Horse Breeding Society for Hunter Brood Mares, viz.:—The Mare awarded the Medal must possess a certificate of soundness from hereditary disease, signed by the Bath and West Society's appointed Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the animal on the Show Ground. Any Hunter Brood Mare, 8 years old or over, having been either awarded one of the Society's Gold Medals since 1910, or selected as Reserve for same, or having been passed sound after January 1, 1911, by a Veterinary Surgeon appointed by the Hunters' Improvement and National Light Horse Breeding Society, shall be exempt from further examination upon the owner producing at the time of exhibition the official veterinary certificate issued by the Secretary of that Society.

49. The following special conditions apply only to the Medal offered by the Hunters' Improvement and National Light Horse Breeding Society for best Mare or Gelding of any age exhibited in the Saddle Classes. The Hunter awarded the medal must possess a certificate of soundness from hereditary disease, signed by the Bath and West Society's Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the animal on the Show Ground. The selected Mare, if unregistered, or the selected Gelding, if unentered, must be registered or entered within a month of the award in the Hunter Stud Book. No animal may take more than one of

these medals in 1925. The Judge, in awarding the Medal, is instructed to give preference to animals showing weight-carrying properties.

NOTE.—No awards of the above-named Society's Prizes or Medals to a Hunter named and registered in the Hunter Stud Book and subsequently entered by the owner under another name, will be recognised or confirmed unless a re-entry has been previously lodged by the owner for the Hunter Stud Book and the new name registered by the Society.

50. The following special conditions apply only to the Silver Medal offered by the Hackney Horse Society in the Harness Classes. All horses competing for the Medal must be by a *Registered Hackney Sire*. All Geldings must be registered in the Stud Book. A Certificate signed by the Breeder of any unregistered mare must be forwarded to the Secretary of the Hackney Horse Society before the Medal is despatched. Each animal must be examined by a qualified Veterinary Surgeon on the Show ground, and a Certificate of Soundness must be supplied. The Medal must be open to all Classes, and not confined to local competition, and the name and number of the sire, and the name and address of the breeder of each animal should appear in the Catalogue. No animal can take more than one of the Silver Harness Medals in any one year.

51. The Jumping Competitions will be carried out in accordance with, and judged under the rules of, the Show Jumping Association. The jumps may consist of single hurdle, gate, double hurdle, bank, wall, and water, at the discretion of the Judge and Stewards. Each horse competing shall have its catalogue number affixed in such a way as to be easily seen by the general public.

CATTLE.

52. All cattle must be properly secured to the satisfaction of the Officers of the Society on being brought to the gate of the Yard, or they will not be admitted. All Bulls must have a ring or clamp attached to the nose and, in the aged Classes, must be provided with a strong chain, and be led with a proper stick.

53. All cattle will be required to be paraded in the ring at least once a day at the discretion of the Stewards.

54. No Bull calved before January 1st, 1923 or in the Aberdeen-Angus Classes before December 1st, 1922, will be eligible to receive a Prize until certified to have served not less than six different Cows (or Heifers) previous to June 1st, 1925, and to be the sire of live calves dropped in the year 1925, or in the Aberdeen-Angus Classes after December 1st, 1924.

55. No Cow or Heifer, entered as in-milk, will be eligible to receive a Prize unless certified to have had a living Calf within the fifteen months preceding the date of the Show, or that the Calf, if dead, was born at the proper time.

56. Every Cow or Heifer in-milk shall be milked dry in the Show Yard by 7.30 p.m. on the evening preceding the day of judging, in the presence of an officer of the Society appointed for the purpose.

57. Any animal in the Cattle Classes found to be artificially coloured will be disqualified.

58. The milk yielded by Cows in the Show Yard must not be sold at the stalls, but will be purchased by the Society for the purposes of the Dairy at a price to be agreed upon, and will be paid for on delivery at the Milk Receiving Office in the Dairy.

59. The following conditions apply only to the prizes offered for Pedigree Dairy Shorthorn Milking Cows:—The Cows and Heifers entered will be clean milked out at 6 o'clock on the evening preceding the opening of the Show to the satisfaction of the Stewards, and will be again milked in the ring on the first morning of the Show in the presence of the Judge, who shall see the Milk

weighed, and any animal not yielding up to the following standard will not be awarded a prize. Ages of cows to be calculated to the date on which the cow or heifer produced her last calf :—

	Having Calved within 2 calendar months of the 1st day of the Show.	Having calved between 2 and 3 calendar months of the 1st day of the Show.	Having calved more than 3 calendar months of the 1st day of the Show.
	lbs. of milk.	lbs. of milk.	lbs. of milk.
Cows, 5 years and upwards ..	30	27	24
Cows, 4 years and under 5 years..	26	23	20
Cows or Heifers, 3 years and under 4 years	22	19	16
Heifers, under 3 years old ..	18	15	12

60. The following conditions shall apply only to the prizes offered for Pedigree Dairy Shorthorn Bulls and Heifers in Classes 82 & 84:—No Bull is eligible to compete unless it has been registered or accepted for registration in the Year Book of the Dairy Shorthorn Association. The dam and sire's dam of the Animals entered to have received, in or before 1918, a Certificate of Merit in Milking trials or tests recognised by the Dairy Shorthorn Association, or in an inspection class confined to Pedigree Dairy Shorthorns where the standard weight of milk has been a necessary qualification, or to hold a yearly record, published in the Association's Year Book, up to mid-day, October 1st, 1919, or after that date a record within 315 days after calving (published or accepted as eligible for publication as follows) :—(1) Cows, 4 years old and upwards at date of calving, 8,000lbs. ; (2) Cows, over 3 years old and under 4 years old at date of calving, 6,000lbs. ; (3) Heifers, 3 years old and under at date of calving, 5,000lbs. No Bull or Cow having taken one of the Association's Prizes is eligible to compete again the same year, except at the R.A.S.E. Show. The prizes in this class will not be awarded unless there are at least three individual exhibitors. A certificate from the Dairy Shorthorn Association stating that the Bull is entered in their Register must be furnished by the exhibitor at the time of making the entry.

61. In the Kerry and Dexter Classes clipping (except in the case of a few hairs on the top of the tail) will disqualify an animal.

62. The following conditions apply to animals entered in the Milk and Butter Test Classes :—The date of last calving must be given on the entry form and, when an animal calves between the date of entry and that of the Show, notice of such calving must be sent to the Secretary or the animal may be disqualified. Points for Lactation will be allowed as follows :—One point for every completed 10 days since calving, calculated to the first day of the show, deducting the first 40 days. Maximum lactation points 12.

63. Except in Local and Dairy Classes, every animal entered for competition must be entered, or certified as eligible to be entered, in the Herd Book of its Breed, where such Herd Book exists and has been in existence for not less than seven years, and all cattle must be tattooed in accordance with the rules of their respective Breed Societies, where such rules exist. Where an animal is entered by the Exhibitor as eligible for entry in the Herd Book of its breed, proof of such eligibility must be furnished to the Secretary at the time of making the entry.

SHEEP.

64. Each pen of Ewes must be of the same Flock.

65. The following conditions apply to the Medal offered by the South-down Sheep Society:—The sheep competing must be entered, or eligible for entry in the Flock Book, and there must be at least three competitors.

66. Except in Local Classes every animal entered for competition must be entered or certified as eligible to be entered, in the Flock Book of its Breed, where such Flock Book exists and has been in existence for not less than seven years, and all Sheep must be tattooed in accordance with the rules of their respective Breed Societies where such rules exist. Where an animal is entered by the Exhibitor as eligible for entry in the Flock Book of its breed, proof of such eligibility must be furnished to the Secretary at the time of making the entry.

Pigs.

67. All Sows farrowed before 1925 shall be certified to have had a litter of live Pigs within six months preceding the first day of exhibition, or to be in-Pig at the time of entering, so as to produce a litter of Pigs, farrowed at their proper time, before the 1st of September following. In the case of in-Pig Sows the Prize will be withheld until the Exhibitor shall have furnished the Secretary with a certificate of farrowing as above. If the required Certificate, which must be on a form obtainable from the Secretary, is not received on or before the 15th September following, the prize awarded will be forfeited.

68. All Pigs exhibited with a Sow shall be her own produce, of the same litter, and not exceeding two months old at the time of the Show.

69. No Sow above 18 months old that has not produced a litter of live Pigs shall be eligible to compete in any of the Classes.

70. Any animal in the Pig Classes found to be artificially coloured, whitened or powdered will be disqualified.

71. Should any question arise as to the age of any exhibit in the Pig Classes, the Stewards shall at the request of the Judge, have the state of their Dentition examined by a competent authority. If the state of the Dentition shall indicate that the age of any of the Pigs does not agree with the Dentition Test, the Stewards shall report the same to the Council, who shall have power to disqualify such Pig or Pigs. The following is the state of Dentition in Pigs which will be considered as indicating that they exceed the ages specified below:—Six Months: Pigs having their corner permanent incisors cut will be considered as exceeding this age. Nine Months: Pigs having their permanent tusks more than half up, will be considered as exceeding this age. Twelve Months: Pigs having their central permanent incisors up, and any of the three first permanent molars cut, will be considered as exceeding this age. Fifteen Months: Pigs having their lateral temporary incisors shed, and the permanents appearing, will be considered as exceeding this age. Eighteen Months: Pigs having their lateral permanent incisors fully up will be considered as exceeding his age.

72. Except in the Local Classes, every animal entered for competition must be entered or certified as eligible to be entered in the Herd Book of its breed, where such Herd Book exists and has been in existence for not less than seven years and must conform to the rules of their respective Societies. In the Berkshire classes the exhibits must be entered or accepted for entry in the British Berkshire Herd Book and in the Large Black Classes the official ear-marker bearing the Herd Book number must be in the ear of all pigs entered, and the Judges will be instructed not to award prizes unless this regulation is observed, or a reasonable explanation given for the absence of the marker.

GOATS, CIDER, HOPS, POULTRY, DAIRY PRODUCE, BUTTER-MAKING, MILKING AND SHOEING COMPETITIONS.

For Conditions and Regulations see entry form.

ADJUDICATION OF PRIZES

73. The Judges are instructed as follows, and entries are received subject to this :—

a. Not to award any Prize or Commendation unless the entry possesses sufficient merit.

b. Not to award a Prize to any Horse or Mare in the Breeding Classes, unless it is free from unsoundness likely to be transmitted to its progeny ; or if a Gelding, unless free from unsoundness ; in either case, an accident having temporary consequences only excepted, and in awarding the Hunters' Improvement Society's Medals to give preference to animals showing weight-carrying properties.

c. In awarding Prizes to Cattle, Sheep, and Pigs, to decide according to the relative merits of the animals for Breeding purposes, and not to take into consideration their present value to the butcher.

d. To make the milking capacity and form of udder one of the chief points in awarding prizes to Cows and Heifers in milk.

e. To draw the attention of the Stewards to any exhibit that has been improperly prepared for exhibition or is wrongly entered.

f. To give in a "RESERVE NUMBER" in each Class, indicating the animal or exhibit which in their opinion possesses sufficient merit for the Prize, if the animal or exhibit to which the Prize is awarded should become disqualified. Should the "Reserved Number" succeed to a prize, and be itself disqualified, the prize will be forfeited.

g. Immediately after the Judging to deliver to the Stewards their signed awards stating the numbers to which the Prizes are adjudged, and noting all disqualifications.

74. Should any question arise upon which the Judges may desire a further opinion, the Stewards shall provide them with a Referee.

PAYMENT OF PRIZES.

75. Cheques for the Prizes awarded (except where further qualification of an animal is required) will be drawn at the meeting of the Finance Committee held in July, 1925, and will then be forwarded by post to the Exhibitors to whom they have been awarded.

INTERPRETATION OF CONDITIONS.

76. The Society reserves to itself by its Council the sole and absolute right to interpret these or any other prescribed conditions and regulations, or Prize Sheets, and to arbitrarily settle and determine all matters, questions or differences in regard thereto, or otherwise arising out of or connected with or incident to the Show. Also to refuse and to cancel any entries, disqualify Exhibitors, prohibit exhibition of entries, vary or cancel awards of prizes or reserved numbers, and relax conditions, as the Society may deem expedient.

POULTRY.

Entry Fees : Class 1, Members, 3/- ; Non-Members, 5/- ;
Other Classes, Members, 2/- ; Non-Members, 3/-
each entry.

Judges—A. G. PITTS, Berrow, Burnham-on-Sea—Classes 1 to 22, 49 to 54 and 61 to 64, and G. DOBLE, Royal Ashton Hotel, Taunton—(Classes 1, 23 to 48 and 55 to 70).

*The Birds in Classes 1 to 48 must have been hatched
previous to January 1st, 1925.*

CLASS.	First Prize.		Second Prize.		Third Prize.	
	£	s.	£	s.	£	s.
1.—Any Two Pure Breeds, best mated to cross for producing Table Poultry.—Cock and 3 Hens, bred in 1923 or 1924, the property of one Exhibitor.. .. .	3	0	2	0	1	0
2.—COCHIN or BRAHMA—Cock	1	0	0	15	0	10
3.—Ditto—Hen	1	0	0	15	0	10
4.—PLYMOUTH ROCK (Barred)—Cock	1	0	0	15	0	10
5.—Ditto—HEN	1	0	0	15	0	10
6.—Ditto (Any other variety)—Cock	1	0	0	15	0	10
7.—Ditto—Hen	1	0	0	15	0	10
8.—ORPINGTON (Black)—Cock	1	0	0	15	0	10
9.—Ditto—Hen	1	0	0	15	0	10
10.—Ditto (Any other variety)—Cock	1	0	0	15	0	10
11.—Ditto—Hen	1	0	0	15	0	10
12.—MINORCA—Cock	1	0	0	15	0	10
13.—Ditto—Hen	1	0	0	15	0	10
14.—RHODE ISLAND RED—Cock	1	0	0	15	0	10
15.—Ditto—Hen	1	0	0	15	0	10
16.—SUSSEX (Light)—Cock	1	0	0	15	0	10
17.—Ditto—Hen	1	0	0	15	0	10
18.—SUSSEX (Any other variety) Cock	1	0	0	15	0	10
19.—Ditto—Hen	1	0	0	15	0	10
20.—DORKING (Any variety)—Cock	1	0	0	15	0	10
21.—Ditto—Hen	1	0	0	15	0	10
22.—LANGSHAN—Cock or Hen	1	0	0	15	0	10
23.—WYANDOTTE (White)—Cock	1	0	0	15	0	10
24.—Ditto—Hen	1	0	0	15	0	10
25.—Ditto (Columbian)—Cock	1	0	0	15	0	10
26.—Ditto—Hen	1	0	0	15	0	10
27.—Ditto (Any other variety)—Cock	1	0	0	15	0	10
28.—Ditto—Hen	1	0	0	15	0	10
29.—LEGHORN (White)—Cock	1	0	0	15	0	10
30.—Ditto—Hen	1	0	0	15	0	10
31.—Ditto (Any other colour)—Cock	1	0	0	15	0	10
32.—Ditto—Hen	1	0	0	15	0	10
33.—CAMPINE—Cock	1	0	0	15	0	10
34.—Ditto—Hen	1	0	0	15	0	10
35.—HAMBURG (Any variety)—Cock	1	0	0	15	0	10
36.—Ditto—Hen	1	0	0	15	0	10

POULTRY—continued.						First Prize.		Second Prize.		Third Prize.	
						£	s.	£	s.	£	s.
37.—	OLD ENGLISH GAME (Black Red)—	Cock	..	..	..	1	0	0	15	0	10
38.—	Ditto—	Hen	..	..	..	1	0	0	15	0	10
39.—	Ditto (Any other colour)—	Cock	..	..	..	1	0	0	15	0	10
40.—	Ditto—	Hen	..	..	..	1	0	0	15	0	10
41.—	INDIAN GAME—	Cock	..	..	..	1	0	0	15	0	10
42.—	Ditto—	Hen	..	..	..	1	0	0	15	0	10
43.—	FRENCH (including Faverolles)—	Cock	..	..	..	1	0	0	15	0	10
44.—	Ditto—	Hen	..	..	..	1	0	0	15	0	10
45.—	ANCONA—	Cock	..	..	..	1	0	0	15	0	10
46.—	Ditto—	Hen	..	..	..	1	0	0	15	0	10
47.—	ANY OTHER DISTINCT BREED not previously mentioned (excluding Bantams)—	Cock	..	..	..	1	0	0	15	0	10
48.—	Ditto—	Hen	..	..	..	1	0	0	15	0	10

SELLING CLASSES.

49.—	ANY DISTINCT BREED—Cock or Cockerel (Price not to exceed £1 ls.)	..	..	..	..	1	0	0	15	0	10
50.—	ANY DISTINCT BREED—Hen or Pullet (Price not to exceed £1 ls.)	..	..	..	..	1	0	0	15	0	10

CHICKENS OF 1925.

51.—	COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX or DORKING—	Cockerel	..	1	0	0	15	0	10
52.—	Ditto—	Pullet	..	1	0	0	15	0	10
53.—	MINORCA, WYANDOTTE, LEGHORN, CAMPINE, HAMBURG, FAVEROLLES or French—	Cockerel	..	1	0	0	15	0	10
54.—	Ditto—	Pullet	..	1	0	0	15	0	10
55.—	GAME, MALAY, or any other Distinct Breed not previously mentioned—	Cockerel	..	1	0	0	15	0	10
56.—	Ditto—	Pullet	..	1	0	0	15	0	10

LIVE TABLE POULTRY.

57.—	Pair of COCKERELS of any Pure Breed, hatched in 1925	..	1	0	0	15	0	10
58.—	Pair of PULLETS of any Pure Breed, hatched in 1925	..	1	0	0	15	0	10
59.—	Pair of Cross-bred COCKERELS, hatched in 1925	..	1	0	0	15	0	10
60.—	Pair of Cross-bred PULLETS, hatched in 1925	..	1	0	0	15	0	10

POULTRY—continued.

UTILITY POULTRY.

POULTRY— <i>continued.</i>					First Prize. £	Second Prize. £	Third Prize. £
UTILITY POULTRY.							
61.—Light Breed—Cock	..	..	..	..	.. 1 0	0 15	0 10
62.—Ditto—Hen	..	..	..	..	.. 1 0	0 15	0 10
63.—Heavy Breed—Cock	..	..	..	..	.. 1 0	0 15	0 10
64.—Ditto—Hen	..	..	..	..	.. 1 0	0 15	0 10

DUCKS, GEESE AND TURKEYS.

65.—DRAKE or DUCK (Aylesbury)	..	..	..	..	..	1 0 0	15 0 10
66.—" " (Rouen)	..	..	..	..	..	1 0 0	15 0 10
67.—" " (Indian Runner)	..	..	..	..	..	1 0 0	15 0 10
68.—" " (Any other variety)	..	..	..	..	..	1 0 0	15 0 10
69.—GANDER or GOOSE	..	..	..	..	..	1 0 0	15 0 10
70.—TURKEY—Cock or Hen	..	..	..	..	..	1 0 0	15 0 10

POULTRY.

CONDITIONS AND REGULATIONS.

CHARGES, &c.

1. Exhibitors may make an unlimited number of Entries on payment of fees as follows :—

		MEMBERS.		NON MEMBERS.	
		s.	d.	s.	d.
For each entry (Class 1)	.. ..	3	0	5	0
„ (other Classes)	.. ..	2	0	3	0

The above fees include coops, food, and attendance.

N.B.—The above fees *must* be sent with the entries, or no notice will be taken of the latter.

2. The privilege of entering at Member's fees is strictly limited to Members of the Bath and West Society, or of the Kent County Society elected on or before January 31, 1925, and subscribing not less than £1 annually.

3. All entries must be made on the printed forms to be obtained of the Secretary (F. H. STORR, 3, Pierrepont Street, Bath), and such forms must be correctly filled up and returned to the Secretary, together with all fees due, on or before April 30. Exhibitors are requested to carefully examine the List of Prizes and Conditions, as the Society cannot be responsible for any errors made by Exhibitors in the entry forms, and birds entered in a wrong Class will be necessarily excluded from competition. No alterations can be made in entry forms after they have been received by the Secretary.

4. The Council reserve the right to refuse the entries of any person.

5. Exhibitors must state the price and breed of their birds on their entry forms.

SHOW YARD.

6. All birds must be in the Show Yard by 6 p.m. on *Wednesday, May 27*, and no bird can be removed before 7 p.m. on *Tuesday, June 2*. Any Exhibitors who send for their birds must do so between 7 and 8 p.m. on that day.

7. All carriage must be prepaid to Maidstone Railway Station, otherwise the birds will not be received at the Exhibition; but they will be conveyed free of expense from the Station to the Show Yard and back.

8. No Exhibitor or Servant will be allowed into the tent until the birds have been judged.

9. The Poultry Tent will not be open to the public until 2 o'clock on the first day of the Exhibition.

10. A Non-Transferable Admission Ticket for the Exhibition will be sent to each Exhibitor whose entry fees amount to £1 and upwards.

TABLE POULTRY.

11. In these Classes (57 to 60), quality for the table will be considered before mere weight. The date of hatching must be given and, in the case of cross bred birds, the breeds of the parents.

SALES.

12. All birds may be claimed, at the price put upon them, any time after 4 o'clock on Thursday, May 28, and a sale *must take place* if the price stated be paid to the Clerk in the Poultry Office at the time of claiming. *No alteration can be made in the prices stated on the entry forms and in the Catalogue until after Saturday, May 30, when the price may be reduced on payment to the Steward of one shilling per pen on each alteration.* Birds must be *sold in pens*, and the price stated must include the basket. Birds entered in selling classes must be sent in separate hampers. A charge of 10 per cent. will be made for all birds sold. The persons who have the management of the sales cannot take charge of birds which are disposed of privately.

AWARDS.

13. No second prize will be given in any of the Classes unless there are three entries, and no third prize unless there are six entries.

DISQUALIFICATION.

14. The Judges are empowered to withhold a prize or prizes where the birds are not considered of sufficient merit, or in the chicken classes where they consider them over age, and are instructed to disqualify any that have been clipped, drawn, trimmed, marked, or dyed. In the Game Classes birds can be shown either dubbed or undubbed.

15. An Exhibitor detected in a false statement as to the age, etc., of any bird, or in any other practice calculated to deceive or mislead the Judges or Stewards, shall forfeit all or any prizes awarded to him or her at the Show, and will be disqualified from competing at any future Show of the Society, and the Council shall have power to inform other Societies of their action in this respect.

16. No person who shall have been shown to the satisfaction of the Council to have been excluded from exhibiting for Prizes at the exhibition of any other Society in consequence of having attempted to obtain a Prize by giving a false Certificate, or by other unfair means, and no person who is under exclusion from any Breed Society for fraudulent practices, shall be allowed to exhibit at this or any other Meeting of the Society.

17. Unhealthy birds will not be exhibited, but will be immediately returned to their owners, and the fees will be forfeited.

PROTESTS.

18. In order to check frivolous and vexatious protests, no protest will be entertained unless accompanied by a deposit of £1 in each case; and in case the protest is not substantiated the deposit may be forfeited to the Funds of the Society. All protests must be made before 12 o'clock (noon) on Friday, May 29.

FORFEITS.

19. Persons entering birds and failing to send the same to the Exhibition will forfeit the entrance fee for each pen so left vacant.

GENERAL.

20. All birds shown must be *bona fide* the property of the Exhibitor.

21. For each pen entered the Exhibitor will receive a label, on the reverse side of which he must legibly write his name and address for the return journey.

22. All eggs laid at the Exhibition will be destroyed.

23. The Stewards pledge themselves to take every care of the birds exhibited, but neither they nor the Society will, in any case, be responsible for any accident loss or damage, from whatever cause arising, the exhibits being entered at the

sole risk of the Exhibitors, and Exhibitors will be required to hold the Society harmless in the event of loss.

24. In case of death of any bird during the Exhibition, it will be sent back for the inspection of the Exhibitor.

25. The Poultry Department is subject to the Rules and Regulations of the Society and its officers.

* * *The use of properly-constructed Poultry Baskets will facilitate the safe and speedy conveyance of the birds to and from the Exhibition and all Birds entered in selling Classes must be sent in separate hampers.*

The Society cannot, under any circumstances, undertake to send telegrams to Exhibitors as to Judges awards.

Applications for Catalogues should be made only to the Publishers, MESSRS. W. LEWIS & SONS, Herald Press, Bath.

By order of the Council.

3, Pierrepont Street, Bath.

TELEGRAPHIC ADDRESS:—"AGRICULTURE, BATH."

TELEPHONE No 610.

F. H. STORR, Secretary.

FINANCIAL STATEMENTS

FOR

1924

WITH ITEMS OF 1923 FOR COMPARISON.

	PAGES.
SUMMARY OF CASH ACCOUNT	clxxiv—clxxv
ANNUAL CASH ACCOUNT	clxxvi—clxxxv
ASSETS AND LIABILITIES ACCOUNT	clxxxvi
FINANCIAL RESULT OF SHOW	clxxxvii

**The Bath and West and
SUMMARY OF THE CASH ACCOUNT
WITH COMPARATIVE**

CR.

Page of accompany- ing Cash Account.	RECEIPTS.	1924. TAUNTON.			1923. SWANSEA.		
		£	s.	d.	£	s.	d.
	General :—						
clxxxvi	Dividends and Interest	955	0	4		931	2 10
"	General	0	1	0		0	1 0
"	Subscriptions from Members	1,181	13	0		1,142	15 0
"	Life Members	70	0	0		45	0 0
"	Journal	65	14	3		65	17 0
					2,272	8	7
						2,184	15 10
	Show :—						
clxxvii	Implements	3,428	6	5		2,081	16 6
"	Horses	1,248	4	0		1,269	16 0
"	Cattle, Sheep, Goats and Pigs	2,248	10	8		2,030	16 8
"	Catalogues, Fodder, &c.	118	5	0		127	15 5
		3,615	5	8		3,428	8 1
clxxx	Poultry	89	0	0		96	7 0
"	Shoeing	30	12	0		33	18 0
"	Timbering and Splicing					6	16 0
"	Music	24	12	10			
"	Small Holdings	81	2	0			
clxxxii	Cheese and Butter	122	2	3		80	5 6
"	Working Dairy	165	13	7		156	2 8
"	Older	12	18	0		12	19 6
"	Admissions	6,668	10	9		13,752	6 3
clxxxiv	Unapportionable :—						
	Contract Premiums and Clock						
	Rooms	725	12	5		680	2 4
	Sales and Fittings	610	18	5		664	7 9
	Local Committee for Police					157	10 0
		1,336	10	10		1,502	0 1
	Subscription from Towns	1,600	0	0			
					17,175	0	4
					10,447	8	11
					1,649	3	11
	Queensland Stock Redeemed					622	3 10
	Timber in hand from 1922 Show						
	Deposit returned	4,500	0	0		8,000	0 0
	Balance in Bank, January 1st	350	0	6		732	18 5
					£25,946	13	4
					£33,600	17	8

Southern Counties Society.**FOR THE YEAR ENDING DEC. 31st, 1924.****STATEMENT FOR 1923.****DR.**

Page of accompany- ing Cash Account.	PAYMENTS.			1924. TAUNTON.			1923. SWANSEA.		
				£	s.	d.	£	s.	d.
	General:—								
clxxvii	Salaries			1,314	12	9	1,327	9	7
"	Printing, Postage, Stationery, &c.			491	9	1	542	4	2
"	Journal			489	12	7	432	6	4
							2,445	14	5
	Show:—						2,272	0	1
clxxix	Implements			1,255	16	11	1,282	5	3
"	Horses			1,052	19	7	1,843	0	0
"	Cattle, Sheep, Goats and Pigs			4,683	9	5	3,523	5	4
"	Fodder, &c.			952	12	0	1,244	14	3
				7,589	1	0	6,910	19	7
clxxxI	Poultry			368	6	4	392	17	11
"	Shoeing			194	12	1	247	19	2
"	Timbering and Splicing						30	7	1
"	Nature Study and Handicrafts			178	17	10	232	11	7
"	Forestry			197	9	8	191	6	1
"	Music.			169	9	9			
"	Small Holdings			78	5	2			
"	Horticulture			331	8	2	383	4	1
clxxxlii	Cheese and Butter			278	18	0	265	4	0
"	Working Dairy			645	1	11	737	18	9
"	Cider			153	1	0	163	1	1
"	Bees			59	4	8	10	0	0
"	Public Announcements			673	1	9	645	0	0
clxxxv	Unapportionable:—								
	Erection of Offices, &c.	2,267	8	1			2,768	8	4
	Carriage of Plant	256	6	5			173	4	0
	Stand Fittings	259	3	4			279	16	3
	Police	263	3	10			519	15	0
"	Miscellaneous	624	13	8			911	2	11
				3670	15	4	4,652	6	6
							15,843	9	7
"	Experiments						158	4	11
							18,447	8	11
	Investments and Deposit						6,525	0	3
	Balance in Bank, Dec. 31st						974	4	2
							£25,946	13	4
							33,600	17	8

January 19th, 1925.

Audited and found correct.

F. CLIFFORD GOODMAN, F.C.A..

Auditor.

Passed by Council,

January 27th, 1925.

F. H. STORR,

Secretary.

The Bath and West and

Cr. CASH ACCOUNT FOR THE YEAR ENDING DEC. 31st,

RECEIPTS.	1924. TAUNTON.			1923. SWANSEA.		
	£	s.	d.	£	s.	d.
DIVIDENDS AND INTEREST:—						
War Loan Stock	205	5	0			205 2 6
Ditto (to replace Capital lost by Conversion of Consols)	13	19	6			12 4 9
South Australian Stock	32	2	6			31 12 1
New Zealand Stock	48	14	1			54 17 6
India Stock	187	19	9			226 3 0
Queensland Stock	58	10	11			65 19 4
New South Wales Stock	144	1	0			162 6 2
Canadian Pacific Railway Stock	46	10	0			45 15 0
Conversion 3½% Insc. Stock	162	15	0			81 7 6
Interest on Deposit	55	1	10			45 15 0
				955 0 4		931 2 10
GENERAL:—						
Telephone Way-leave				0 1 0		0 1 0
SUBSCRIPTIONS FROM MEMBERS:—						
Arrears	36	16	0			31 3 0
Governors	153	18	0			162 18 0
Subscribers of £1 and upwards	984	19	0			942 14 0
" 10s.	6	0	0			6 0 0
				1,181 13 0		1142 15 0
LIFE COMPOSITIONS:—						
				70 0 0		45 0 0
JOURNAL:—						
Sales	8	16	10			6 14 1
Advertisements	56	17	5			59 2 11
				65 14 3		65 17 0
Carried forward	£	2,272	8 7			

Southern Counties Society.**1924, WITH COMPARATIVE STATEMENT FOR 1923.****Dr.**

PAYMENTS.	1924. TAUNTON.		1923. SWANSEA.	
	£	s. d.	£	s. d.
SALARIES:—				
Secretary & Editor	650	0 0	650	0 0
Assistant Secretary	450	0 0	450	0 0
Office Staff	154	12 9	167	9 7
Auditor	30	0 0	30	0 0
Consulting Chemist	30	0 0	30	0 0
		1,314 12 9		1,327 9 7
MISCELLANEOUS:—				
Printing	37	9 9	77	13 9
Stationery and Finance Books	39	0 6	46	14 8
Postages, Telegrams, Insurance, Cheque and Receipt Stamps	91	10 4	116	17 6
Ground Rent and Rates	28	17 0	30	6 4
Income and Property Tax	156	5 3	9	7 6
Travelling Expenses	50	10 3	48	2 5
Carriage of Goods	7	8 6	12	13 0
Directories and Reference Books	0	14 0	4	11 6
Subscriptions	12	5 0	9	2 0
Repairs and Fittings	13	9 9	40	5 5
Hire of Council Rooms	2	2 0	2	2 0
Fuel and Light	12	16 11	9	5 4
Finance Committee's Expenses	16	11 4	12	18 8
Telephone	16	6 0	12	4 1
Bank Charges	6	2 6	10	0 0
Council Grants and Allowance to Widow of late Secretary	200	0 0	100	0 0
		691 9 1		542 4 2
JOURNAL:—				
Printing and Stationery	323	3 3	306	15 7
Plans and Blocks	24	18 0	10	6 8
Distribution	34	11 4	36	1 1
Postages, Stationery, Reference Books, etc.	7	10 0	7	10 0
Authors	49	10 0	41	13 0
		439 12 7		402 6 4
Carried forward	£	2,445 14 5		

CR.

CASH ACCOUNT—continued.

RECEIPTS.	1924 TAUNTON.		1923. SWANSEA.	
	£	s. d.	£	s. d.
Brought forward			2,272	8 7
IMPLEMENTS:—				
Fees for Space:—				
Machinery-in-Motion Shedding	1,109	0 0		849 10 0
Ordinary	295	0 0		314 0 0
Miscellaneous	210	0 0		258 15 0
Boarded	987	5 0		797 10 0
Seed	56	5 0		66 5 0
Uncovered Ground	608	12 5		540 14 2
Catalogue Fees	77	19 0		72 18 10
Entry Fees	76	0 0		70 10 0
Additional Assistants' Tickets	13	5 0		21 13 6
			3,428	6 5
HORSES, CATTLE, SHEEP, GOATS & PIGS:—				
Horses:—Entry Fees and Fines £355 0 0				245 5 0
Grand Stand Admissions 864 4 0				936 16 0
Special Prizes 29 0 0				87 15 0
	1,248	4 0		1,269 16 0
CATTLE, SHEEP, GOATS AND PIGS:—				
Entry Fees £1,848 5 0				1,084 10 0
Fines 29 10 0				17 10 0
Special Prizes 371 1 8				928 16 8
	2,248	16 8		2,030 16 8
Catalogues, Manure and Fodder	118	5 0		102 11 5
Advertisement in Prize List (2 years)				25 4 0
				127 15 5
			3,615	5 8
Carried forward	£	9,316 0 8	3,428	8 1

CASH ACCOUNT—*continued.*

DR.

PAYMENTS.	• 1924. TAUNTON.		1923. SWANSEA.			
	£	s. d.	£	s. d.		
Brought forward			2,445	14 5		
IMPLEMENTS :—						
Shedding	1,105	10 9	1,086	17 6		
Stewards and Assistants	98	7 8	103	18 9		
Printing, Stationery, etc.	51	18 6	68	19 0		
Fees returned			22	10 0		
			1,255	16 11		
			1,282	5 3		
HORSES, CATTLE, SHEEP, GOATS & PIGS :—						
Horses :—Prizes	£1,034	10 0	1,010	9 0		
Shedding & Grand Stand	774	18 4	666	10 2		
Stewards and Assistants	90	17 8	122	9 2		
Judges	48	3 7	43	11 8		
Fees returned	4	15 0				
			1,843	0 0		
		1,952	19 7	1,252	11 2	
Cattle Prizes	1,347	8 6	677	0 0		
Sheep Prizes	727	0 0	19	0 0		
Goats Prizes	13	0 0	394	0 0		
Pigs Prizes	513	0 0				
Shedding and Canvas	1,475	17 1	1,192	6 7		
Stewards and Assistants	134	12 9	80	13 3		
Judges	195	3 1	195	4 4		
Fees returned	274	5 6	3	10 0		
Disinfectants	3	2 6				
			3,823	5 4		
		4,693	9 5	543	4 11	
Buildings, etc.	457	8 2	445	4 9		
Fodder and Insurance	258	2 8	17	16 6		
Forage Steward and Assistants	8	19 6	30	7 9		
Veterinary Inspectors	39	4 1	30	0 0		
Rosettes	15	5 10	169	18 7		
Printing, Stationery, etc.	152	15 8	18	1 9		
Refreshments for Judges	20	16 6				
			1,244	14 3		
		952	12 0	7,589	1 0	
			7,589	1 0	6,910	19 7
Carried forward			£11,290	12 4		

(clxxx)

CASH ACCOUNT—continued.

RECEIPTS.		1924. TAUNTON.		1925. SWANSEA.	
		£ s. d.	£ s. d.	£ s. d.	
Brought forward			9,316 0 8		
POULTRY:—					
Entry Fees		88 6 0		95 11 0	
Commission on Sales		0 14 0		0 16 0	
			89 0 0	96 7 0	
SHOEING:—					
Entry Fees		15 12 0		27 18 0	
Special Prizes		15 0 0		6 0 0	
			30 12 0	33 18 0	
TIMBERING AND SPLICING					
				16 16 0	
MUSIC:—					
Chairs.			24 12 10		
SMALL HOLDINGS:—					
Entry Fees		8 19 6			
Prizes		72 2 6			
			81 2 0		
Carried forward			£ 9,541 7 6		

CASH ACCOUNT—continued.

DR.

PAYMENTS.	1924. TAUNTON.		1923. SWANSEA.
	£ s. d.	£ s. d.	£ s. d.
Brought forward		11,290 12 4	
POULTRY :—			
Sheds, Staging, Pens and Runs	159 10 4		176 10 6
Steward and Assistants	40 17 6		40 10 2
Judges	6 11 0		14 10 6
Prizes	137 10 0		130 10 0
Printing, Stationery, Carriage, etc.	23 17 6		24 16 9
		368 6 4	392 17 11
SHOEING :—			
Prizes	53 10 0		44 10 0
Judges	13 6 4		13 17 7
Anvils, Forges, Coal, Horses, Printing, etc.	23 19 7		43 19 1
Shedding	72 4 0		112 15 2
Steward and Assistants	16 12 2		17 17 4
Exhibition of Models	15 0 0		15 0 0
		194 12 1	247 19 2
TIMBERING AND SPLICING			30 7 1
NATURE STUDY AND HANDICRAFTS :—			
Pavilion and Staging	162 14 6		192 17 0
Stewards and Assistants	11 4 10		33 12 4
Printing, Postage, Carriage, etc.	4 18 6		6 2 3
		178 17 10	232 11 7
FORESTRY :—			
Pavilion and Staging	111 5 5		123 16 0
Steward, Judge and Assistants	15 15 10		11 16 0
Printing, Postage, etc.	4 11 3		6 11 0
Prizes, Grants and Demonstrator	65 17 2		49 3 1
		197 9 8	191 6 1
MUSIC :—			
Band Stand, Chairs, etc.	39 5 11		
Band and Expenses	116 11 0		
Steward and Assistants	18 12 10		
		169 9 9	
SMALL HOLDINGS :—			
Prizes	64 0 0		
Judges	12 11 11		
Printing, etc.	1 13 3		
		78 5 2	
Carried forward		£ 12,477 13 2	

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CASH ACCOUNT—*continued.*

RECEIPTS.	1924. TAUNTON.		1923. SWANSEA.	
	£	s. d.	£	s. d.
Brought forward			9,541	7 6
CHEESE AND BUTTER:—				
Entry Fees	89	10 0	57	10 6
Sales	13	12 3	12	15 0
Special Prizes	17	0 0	10	0 0
			122	2 3
			80	5 6
WORKING DAIRY:—				
Entry Fees, Competitions	229	16 6	38	5 6
„ Tests	54	0 0	21	0 0
			88	16 6
			54	5 6
Sale of Produce	61	17 1	85	17 2
Special Prizes, etc.	20	0 0	16	0 0
			165	13 7
			156	2 3
OTHER:—				
Entry Fees and Fines			12	18 0
			12	18 0
ADMISSIONS:—				
Admissions at 5s.	482	5 0	900	10 0
„ „ 4s.	1,848	0 0	2,262	0 0
„ „ 3s.	2,488	11 0	2,754	6 0
„ „ 2s. 6d.	8	2 6	22	15 0
„ „ 2s.	1,486	2 0	6,058	6 0
„ „ 1s. 6d.	99	7 6	164	12 6
„ „ 1s.	85	5 0	626	8 0
Season Tickets, etc.	176	3 9	363	8 9
			6,668	16 9
			13,762	6 3
Carried forward	£	16,510 18 1		

CASH ACCOUNT—continued.

Dr.

PAYMENTS.	1924. TAUNTON.			1923. SWANSEA.		
	£	s.	d.	£	s.	d.
Brought forward				12,477	13	2
HORTICULTURE:—						
Prizes and Gratuities to Exhibitors	149	2	3			150 0 0
Pavilion and Staging	161	0	8			169 8 9
Steward and Assistants, Printing, etc.	21	5	3			13 15 4
				331	8	2
CHEESE AND BUTTER:—						
Judges	10	2	2			9 9 10
Prizes	147	0	0			111 0 0
Stewards and Assistants	17	14	3			18 7 10
Pavilion and Staging	98	3	1			119 6 1
Printing, Stationery, Carriage, etc.	5	18	6			7 0 3
				278	18	0
WORKING DAIRY:—						
Stewards and Assistants	60	9	5			72 11 6
Judges and Demonstrators	54	3	11			49 5 4
Buildings	285	17	5			387 16 9
Printing, Stationery, Postages, etc.	10	8	0			10 10 1
Utensils, Carriage, etc.	93	12	7			88 17 7
Prizes	51	18	9			59 13 9
Coal, Salt, Ice, etc.	13	9	6			11 11 3
Milk and Cream	75	2	4			43 17 6
Purchase of Plant						13 15 0
				645	1	11
CIDER:—						
Pavilion and Staging	34	17	10			41 13 7
Steward and Assistants	23	15	5			27 17 0
Judge	4	0	0			7 12 6
Prizes	60	0	0			50 0 0
Analyses, Carriage, Printing, etc.	30	7	9			35 18 0
				153	1	0
BEEES:—						
Beekeepers' Association	3	16	6			10 0 0
Printing, etc.	2	19	9			
Shredding	52	8	5			
				59	4	8
Carried forward				13,945	6	11

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CASH ACCOUNT—*continued.*

RECEIPTS.	1924. TAUNTON.			1923. SWANSEA.		
	£	s.	d.	£	s.	d.
Brought forward				16,510	18	1
SHOW (UNAPPORTIONABLE):—						
Sales, Fittings, etc.	610	18	5	664	7	7
Contract Premiums	632	7	8	540	5	8
Cloak Rooms, Lavatories, etc.	98	5	2	180	16	8
Local Committee for Police				157	10	0
				1,836	10	10
				1,502	0	1
SUBSCRIPTIONS FROM TOWNS:—						
Taunton for 1924 Show	800	0	0			
Maldstone for 1925 Show	800	0	0			
				1,600	0	0
Timber in hand from 1922 Show				19,447	8	11
Queensland Stock Redeemed				1,640	8	11
Deposit returned				4,500	0	0
Balance in Bank, January 1st				350	0	6
				25,946	18	4
				23,600	17	8

CASH ACCOUNT—continued.

Dr.

PAYMENTS.	1924. TAUNTON.			1923. SWANSEA.		
	£	s.	d.	£	s.	d.
Brought forward				13,945	0	11
PUBLIC ANNOUNCEMENTS :—						
Advertising	306	6	6			277 4 5
Billposting	235	0	0			219 18 11
Railway Placards	78	7	6			85 15 0
Printing	53	7	9			62 1 8
				673	1	9
SHOW (Unapportionable) :—						645 0 0
Official Buildings, etc..	1,938	4	0			2,207 1 0
Hoarding	329	4	1			561 7 4
Carriage of Plant	256	6	5			173 4 0
Stand Fittings	259	3	4			279 16 3
Insurance	62	6	8			75 0 2
Furnishing Official Buildings, etc.	31	2	6			108 14 3
Mess Room, Allotment Expenses, etc..	20	19	4			39 10 10
Gatekeepers, Yardmen and Messengers	184	9	1			198 9 4
Stewards of Finance and Treasurer	25	17	1			45 1 7
Inspector of Cash and Assistant	49	14	10			55 10 7
Secretaries' expenses, Finance and Treasurer's Clerks	43	14	4			47 6 9
Police	263	3	10			519 15 0
Badges, etc.	3	8	6			4 10 0
Catalogues for Press and Officials	15	9	6			21 18 6
Purchase of Plant	23	16	9			44 15 3
Printing, Stationery, etc.	104	13	3			105 14 5
Telegraph and Telephone	49	8	10			44 7 2
Commission on Season Tickets	4	13	0			11 13 6
Council Grants	5	0	0			105 0 0
Show Yard Lecturers						3 10 7
				3,670	15	4
EXPERIMENTS :—						4,652 6 6
Cider—Grant to Cider Institute				100	0	0
ROUGH PASTURES—Lime and Manures .	50	12	5			
Inspection	7	12	6			
				58	4	11
				18,447	8	11
Investments and Deposit				6,525	0	3
Balance in Bank, Dec. 31st				974	4	2
				18,467	1	2
				14,783	16	0
				350	0	6
				£25,946	13	4
				33,600	17	8

JANUARY 19TH, 1925.

I hereby certify that I have examined the foregoing accounts for the year ending December 31st. 1924, compared the payments entered with the vouchers, and found them all in order and correct.

F. CLIFFORD GOODMAN, F.C.A.,

Auditor.

Passed by Council,

January 27th, 1925,

F. H. STORR, Secretary.

ASSETS AND LIABILITIES ACCOUNT TO DECEMBER 31st, 1924, WITH COMPARISON FOR 1923.

ASSETS.				1924.			1923.			LIABILITIES.			1924.			1923.		
INVESTMENTS				TAUNTON.			SWANSEA.						TAUNTON.			SWANSEA.		
£	s.	d.	Market Value on Dec. 31.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1,668	1	6	STOCK.	1,500	0	0	1,332	17	3									
4,090	11	1	New Zealand 3 1/2% 1940.	5,909	19	6	4,161	0	10									
306	5	6	1 War Loan 5% 1929/47.															
			5 Do. to replace caplost by conversion of Consols.	294	8	3	310	17	5									
7,583	15	1	India 3%.	7,377	0	0	8,753	3	5									
4,057	18	0	R. B. Wales 4% 1935.	4,576	2	6	1,230	0	0									
1,000	0	0	San Pedro de Macoris 4% 1935.	1,000	0	0	891	1	11									
1,000	0	0	South African 4% 1940/48.	1,000	0	0	4,723	0	0									
4,000	0	0	Consols 3 1/2% 1940/48.	4,747	16	0	2,525	0	0									
2,500	0	0	N. S. Wales 5% 1935/53.	2,483	0	3												
				23,088	11	7	23,206	2	7									
CASH ON DEPOSIT				1,500	0	0	2,000	0	0									
FUND FOR REPLACEMENT OF CAPITAL.				43	3	11	42	0	3									
SHOW PLANT				1,318	19	0	1,442	15	3									
HOUSE PROPERTY							633	10	7									
FURNITURE AND FITTINGS							172	19	1									
DUE FROM TAUNTON FOR 1924 SHOW				802	3	2	806	9	8									
A/C DUE							800	0	0									
SUBSCRIPTION ARREARS				12	12	0												
				109	17	0												
JOURNAL SALES				2	10	0												
BALANCE IN BANK Dec. 31st				20,995	7	8	27,056	12	11									
				874	4	2	350	0	6									
				£ 27,969	11	10	£ 27,406	13	5									

January 10th, 1925.
 I hereby certify that I have audited the above Balance Sheet and that, in my opinion, it is correct and shows the true position of the Society's affairs according to the Books. The accounts for the Society's Investments have been produced to me, and I have found them in order. The various Stocks have been valued by the Society's Bankers
F. GILFORD GOODMAN, F.C.A., Auditor.

Passed by Council
 January 27th, 1925,
F. H. STORR, Secretary

Bath and West and Southern Counties Society.

STATEMENT SHOWING FINANCIAL RESULT OF THE TAUNTON (1924) SHOW.

Printed Financial State- ments.										
Page		£	s.	d.	£	s.	d.	£	s.	d.
clxxiv	Show Receipts as per Summary	17,175	0	4						
„	Less Contribution for Maidstone Show	800	0	0						
		16,375	0	4						
clxxxvi	Accounts due	12	12	0						
					16,387	12	4			
clxxv	Show Payments as per Summary	15,843	9	7						
clxxxv	Less Show Plant purchased	23	16	9						
	Less 10 per cent. for depre- ciation	2	7	6						
		21	9	3						
					15,822	0	4			
	Profit on Show							£	565	12 0

BATH AND WEST AND SOUTHERN COUNTIES SOCIETY,
 FOR THE
Encouragement of Agriculture, Arts, Manufactures and Commerce.

LIST OF MEMBERS, 1925.

PATRON.

HIS MOST GRACIOUS MAJESTY THE KING.

PRESIDENT.

COL. F. S. W. CORNWALLIS, C.B.E., D.L.

TRUSTEES.

THE MOST HON. THE MARQUIS OF BATH, K.G

SIR J. SHELLEY, BART.

H. B. NAPIER, ESQ.

Names thus () distinguished are Governors.*

Names thus (†) distinguished are Life Members.

** * Members are particularly requested to make the Secretary acquainted with any errors in the names or residences.*

Name	Residence	Sub- scriptions
		£ s. d.
*†His Most Gracious Majesty the King	Windsor Castle .. .. .	..
*†Wales, H.R.H.Prince of K.G.	St. James' Palace, London ..	..
Ackers, Chas. P.	Huntley Manor, Gloucester ..	1 0 0
Ackers, Miss C. V.	Hellings, Wiveliscombe	1 0 0
Ackland, J.	Francis Court, Broadclyst, Exeter	1 0 0
Acland, Alfred Dyke .. ..	.. .. .	1 0 0
†Acland, Right Hon. Sir Arthur H. Dyke	85, Onslow Square, London, S.W.7 .. .. .	..
Acland, Right Hon. F. Dyke, ..	93, Bedford Gardens, Campden Hill, London, W.	1 0 0
Adams, E. C... .. .	The Cedars, Trowbridge, Wilts	1 0 0
Adlam, J. C.	Manor Farm, East Horrington, Wells	1 0 0
Aldridge, D.	Sketchley Hall Farm, nr. Hinckley, Leicester	1 0 0
Alexander, Hubert	5, High Street, Cardiff	1 1 0



Subscriptions.

clxxxix

Name	Residence	Sub- scriptions		
		£	s.	d.
Allen, A.	Chesterblade, Shepton Mallet ..	1	0	0
Allen & Foster	Corn and Seed Merchants, Shep- ton Mallet	1	1	0
Allen & Sons	Cheese Merchants, Shepton Mallet	1	1	0
†Allen, Miss Ida Helena ..	Springfield House, Shepton Mallet .. ..	..	..	..
Allen, W. T.	Bradley House, West Pennard, Bridgwater	1	0	0
Allison, F.	Newbiggin, Penrith, Cumberland	1	0	0
Allott, Major P. B.	Little Ashton, Codford, Wilts ..	1	0	0
Allsebrook, A.	Frenches Farm, Mark Cross, Sussex	1	1	0
Ames, Mrs. O.	Blackdown, Upham, Southampton	1	0	0
Amesbury, A. . . .	Loxton, Axbridge	1	1	0
Anderson, Sir J.	Harrold Priory, Sharnbrooke, Beds	1	0	0
Angerstein, J. R.	Holbrook House, Wincanton ..	1	0	0
Angier, Capt. R.	Mousefield, Newbury, Berks. ..	1	1	0
Anglo-Continental Guano Works	Dock House, Billiter Street, E.C. 3	1	0	0
Anglo-Swiss Condensed Milk Company	Chippenham	1	0	0
*Ansdell C. W.	Leckford Abbas, Stockbridge, Hants	2	0	0
†Aplin, R. M. S.	Digby Hotel, Sherborne .. ..	..	..	..
Argent, W. A.	Ghyll Manor, Rusper, Sussex ..	1	0	0
Armitage, T. C.	Dean Court, Taunton	1	1	0
Armitage, Mrs.	Dean Court, Taunton	1	1	0
Armstrong, E. G.	Sand Farm, Kew Stoke, Somerset	1	0	0
Arnold and Sons	52, Wigmore Street, London, W.	1	0	0
†Ashcomb, Lord	Denbies, Dorking .. ..	..	..	..
†Ashcroft, W.	13, The Waldrons, Croydon ..	..	..	..
Asher, S. G.	Ascot Place, Ascot	1	0	0
Associated Manufacturers Co.	72-80, Mansell Street, Aldgate, E.1	1	0	0
*Astor, Lord	Cliveden, Taplow, Bucks ..	2	0	0
Atkinson, Brig.-Gen. B., C.B., C.M.G.	Mistley Hall, Mannngtree, Essex	1	0	0
Austin, E. A.	Baltonsborough, Glastonbury ..	1	1	0
†Avebury, Lord	High Elms, Hayes, Kent ..	..	..	..
†Aveling, Thomas L.	Rochester .. ..	..	..	..
Avon Manure Company (Ld.)	St. Philip's Marsh, Bristol ..	1	0	0
Awebridge & Co., Ltd. ..	Northgrounds Farm, Chale Green, Isle of Wight	1	1	0
Badcock, H. Jefferies	Broadlands, Taunton	1	0	0
Badock, S. H.	Holmwood, Westbury-on-Trym, Bristol	1	1	0
Bagnall, O. R.	The Howsells, Malvern Link ..	1	0	0
Bainbridge, Mrs. R. C. ..	Elfordleigh, Plympton, Devon ..	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
†Baker, Hiatt C.	Oaklands, Almondsbury	1	0	0
Bamfords (Ld.)	Uttoxeter	1	0	0
Barber, J. Guttridge	Fylde House, Oxford Road, Exeter	1	0	0
Barford & Perkins (Ld.)	Peterborough	1	0	0
Barham, G. T.	Sudbury Park, Wembley, Middlesex	1	1	0
*Barker-Hahlo, H. .. ..	.. ..	2	0	0
Barnes, Major-Gen. Sir R. W. R., K.C.B., D.S.O.	Oakhay, Stoke Canon, near Exeter	1	0	0
Barnett, D. P.	Walterston, Llanearvan, Cowbridge	1	0	0
Barrett, Mrs. D.	Eastbrook, Trull	1	1	0
Barry, Lieut.-Col. A. P.	Baltonsborough, Glastonbury ..	1	0	0
Barstow, J. J. J.	The Lodge, Weston-super-Mare..	1	1	0
Barton, W. L. .. ..	.. ..	1	0	0
Basic Slag and Phosphate Co. (Ld.).. ..	69, Queen Victoria Street, London, E.C.4	1	0	0
Bassett, A. F. .. ..	.. ..	1	0	0
Bastard, H. E.	Tinten Manor, St. Tudy, S.O., Cornwall	1	0	0
*†Bath, Marquis of, K.G.	Longleat, Warminster .. ..	..	..	..
Bath Gas Company	Bath	1	0	0
Bathurst, Hon. B. L.	Lydney Park, Gloucester	1	1	0
Bathurst, Major Sir F. Hervey, Bart., D.S.O.	Somborne Park, King's Somborne, Hants	1	1	0
Bathurst, Lady K. Hervey	Somborne Park, King's Somborne, Hants.	1	1	0
*†Batten, Major H. C., D.S.O.	Aldon, Yeovil .. ..	..	..	..
Batten, Col. Cary	Abbotsleigh, Bristol	1	0	0
Batten-Pooll, R. H.	Road Manor, Bath	1	0	0
†Baxendale, J. Noel	Froxfield Green, Petersfield .. ..	..	..	..
Beak, J. D.	Maiden Bradley, Bath	1	1	0
Beatty, A. Chester	Calehill Park, Little Chart, Kent	1	0	0
Beauchamp, Sir F. B. . . .	Woodborough House, Peasedown St. John, Bath	1	1	0
Beauchamp, L. B.	Norton Hall, near Bath	1	0	0
Bedford, The Misses	The Forge, Upton-on-Severn. ..	1	0	0
Bell, Lieut.-Colonel M. G. E.	Bourne Park, near Canterbury ..	1	0	0
Benett-Stanford, Capt. J.	Hatch House, Tisbury	1	0	0
Bennett, Brothers	Journal Office, Salisbury	1	1	0
Bennett, R. A.	Thornbury, Glos.	1	0	0
Bentall, Edward H. & Co..	Heybridge, Maldon, Essex	1	0	0
Bonyon, H. A.	Englefield House, Reading	1	1	0
*Bonyon, J. Herbert	Englefield House, Reading	5	0	0
Berry, A. E.	Rowgardens Wood, Charlwood, Surrey	1	0	0
Berry, Grosvenor	Mount Bures, Bures, Suffolk ..	1	0	0

Subscriptions.

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Name	Residence	Sub- scriptions
		£ s. d.
Berry, H. W...	Blackmoor Farm, Langford, near Bristol	1 0 0
Berryman, F. H.	Field House, Shepton Mallet ..	1 1 0
Bessant, W.	Skinner's Farm, Woolland, Bland- ford, Dorset	1 0 0
Best, Major T. G.	East Carleton Manor, Norwich ..	1 0 0
†Best, Capt. W.	Vivod, Llangollen, N. Wales ..	..
Best, Hon. J. W., O.B.E. ..	Hincknowle, Melplash, Dorset ..	1 0 0
Beynon, Sir J. W., Bart., C.B.E.	Merthyr House, Cardiff	1 1 0
Biddle, W. F.	Parsonage Farm, Butleigh, Glas- tonbury	1 0 0
Bide, S. and Sons	Pedigree Pig Farm, Farnham, Surrey	1 0 0
Birmingham, C.	Nutscale, The Parks, Minehead ..	0 10 0
†Blackburn, H. P.	Donhead Hall, Salisbury .. ..	..
†Blackstone, G. M.	Blackstone & Co., Ltd., Stamford	..
Blake, Col. M. Lock	Bridge, S. Petherton	1 0 0
Bland, V. S.	Estate Office, Foxhill, Wan- borough, Wilts	1 0 0
Blathwayt, R. W.	Dyrham Park, Chippenham	1 1 0
Blathwayt, Rev. W. E. ..	Dyrham Rectory, Chippenham ..	1 0 0
Blay, G.	New Malden, London, S.W. ..	1 0 0
†Bledisloe, Lord, K.B.E. ..	Lydney Park, Gloucester .. ..	..
Bledisloe, Lady	Lydney Park, Gloucester	1 1 0
Blight, G.	Tregonning, Breage, Helston ..	1 0 0
Blinman, F. R.	Auctioneer, Farrington Gurney, Bristol	1 0 0
Blinman, H. T.	Auctioneer, Farrington Gurney, Bristol	1 0 0
*Blythwood, Lord	Penrice Castle, Reynoldston, S.O., Glamorgon	2 0 0
Blythwood, Lady	Penrice Castle, Reynoldston, S.O., Glamorgon	1 0 0
Board, W. R.	Great Frampton, Llantwit Major, Cardiff	1 0 0
Body, J. B.	Hindhead Court, Hindhead, Surrey	1 1 0
*†Boles, Lt.-Col. Sir Dennis F., Bart., C.B.E., D.L. ..	Watts House, Taunton	..
*Boles, G. F.	17th Lancers, Alival Barracks, Tidworth	2 0 0
Bolitho, R. F.	Ponsandane, Penzance	1 1 0
Bolitho, T. R.	Trengwainton, Hea Moor, Cornwall	1 1 0
Bonar, T. L.	Preston Hall, Aylesford, Kent ..	1 0 0
Bond, A. E.	Wannerton, Kidderminster	1 0 0
Bond E. (W. Evans & Co.)	Hele, Cullompton	1 1 0
Boscawen, Rev. A. T.	Ludgvan Rectory, Long Rock, R.S.O., Cornwall	1 0 0

Name	Residence	Sub- scriptions		
		£	s.	d.
Boscawen, Townshend E. ..	2, Old Burlington Street, London, W.1	1	0	0
Bouverie, H. P.	Brymore, Bridgwater	1	0	0
†Bowen-Jones, Sir J., Bart. ..	The Woodlands, Bicton, near Shrewsbury .. .. .	..	..	..
†Bowerman, Alfred	Sydney Villa, Broadclyst, Exeter ..	..	..	..
Braby, F. & Co. (Ltd.)	Ashton Gate Works, Bristol	1	0	0
Bradford, Thomas & Co.	Salford, Manchester	1	0	0
*Braithwaite, T. S.	Durley Hill, Keynsham, Somerset	2	0	0
Brasnett, A. W., Veterinary Surgeon	Wells	1	0	0
*†Brassey, H. L. C.	Apethorpe Hall, Wansford, Northants .. .. .	..	..	..
†Brassey, Capt. R. B.	Heythrop, Chipping Norton .. ..	..	..	..
Brenton, W. (Ltd.)	St. Germans, Cornwall	1	0	0
Bridges, J. H.	The Court, Eastbourne	1	1	0
Briggs, Mrs. H.	The Grange, North Stoke, Walling- ford, Berks.	1	0	0
<i>Bristol Times and Mirror,</i>				
Proprietors of	Bristol	1	0	0
Brittan, Col. R., D.S.O.	Failand Hill, Failand, Bristol	1	0	0
Britten, Forester	Kenswick Manor, Worcester	1	0	0
Britten, W. C.	Dungeon Farm, Croscombe	1	0	0
†Brocklehurst, H. D.	Sudeley Castle, Winchcombe .. ..	..	..	..
Brockman, F. D.	Broxmore, Herts.	1	0	0
Broughton, B. R.	Manor Farm, North Perrott, Crewkerne	1	0	0
Brown A. and J.	Haydon Hill, Aylesbury	1	0	0
Brown, F. E.	1,403, Neath Road, Swansea	1	0	0
Browning, T.	Nash End Farm, Eastington, Stonehouse, Glos.	0	10	0
Browning, W.	Nash End Farm, Eastington, Stone- house, Glos.	0	10	0
†Bruford, E. J.	Nerrols, Taunton .. .. .	..	..	..
Bruford, R.	Nerrols, Taunton	1	0	0
Brymer, W. J.	West Down Lodge, Winchester	1	0	0
Buchanan, W. G.	Manor House Farm, Abergavenny	1	0	0
Buck, D.	White House, Little Mill, Ponty- pool	1	0	0
Buckingham, Rev. C. L.	Bickleigh Rectory, near Tiverton	1	1	0
†Buckingham, Rev. Preb.	The Rectory, Doddiscombsleigh, Exeter, Devon .. .. .	..	..	..
Buckingham, Capt. F. R.	Dishcombe, South Tawton, near Okehampton	1	0	0
Buckley, S. W.	Danygraig, Pembrey	1	0	0
Budd, Felix S.	Clarendon House, Stow Park, New- port, Mon.	1	0	0
Budd, H. C.	The Paddock, Shepton Mallet	1	0	0

Subscriptions.

cxcliii

Name	Residence	Sub- scriptions		
		£	s.	d.
Budd, J. E.	Tidebrook Manor, Wadhurst, Sussex	1	0	0
Bullows, Miss M. A.	Metchley, Barlows Road, Edgbas- ton, Birmingham	1	1	0
Burdett-Coutts, S.	Earls Place, Mark Cross, Tunbridge Wells	1	0	0
Burdge, J. H.	Yatton, near Bristol	1	1	0
Burnard & Algar	Plymouth	1	0	0
Burrell, C. and Sons	St. Nicholas Works, Thetford	1	0	0
†Bush, H. G.	The Grove, Alveston, Glos. . . . .	..	..	..
Bush, Mrs. L. E.	St. Mary's, Atlantic Road, South, Weston-super-Mare	1	1	0
Busk, Mrs.	Wraxall Manor, Cattistock, Dorset	1	0	0
*Bute, The Marquis of	The Castle, Cardiff	2	0	0
Butler, W.	Gatcombe Farm, Flax Bourton, Bristol	1	0	0
Cable, Lord	Lindridge, near Teignmouth	1	1	0
Cadozo, C. H.	Sedgewell House, Chudleigh, Devon	1	0	0
Cesar, H. and J.	Knutsford, Cheshire	1	0	0
Calley, Miss	Burderop Park, Swindon	1	0	0
†Calmady-Hamlyn, Miss	Pearroc Vean, Buckfast, S.Devon . . . . .	..	..	..
Campbell, J.	31, St. Albans Road, Swansea	1	0	0
Campbell, Major D., D.S.O.	Lady's Wood, Malmesbury, Wilts.	1	0	0
Candy, T. C.	Woolcombe, Cattistock, Dorset	1	0	0
Candy, H. J.	Upper Lodge Farm, Ston Easton, Bath	1	0	0
Carew, C., M.P.	Collipriest, Tiverton	1	0	0
†Carruthers, W., F.R.S.	14, Vermont Road, Norwood, London, S.E. . . . .	..	..	..
†Carter, E.	East Upton, Ryde, Isle of Wight . . . . .	..	..	..
Carter, G. V.	Waterston Manor, Dorchester	1	1	0
Carter, J. B.	8, Julian Road, Folkestone	1	0	0
Carter, J. & Co.	Raynes Park, London, S.W.	1	0	0
Cartridge, W. T. B.	Sidbury, Worcester	1	0	0
Cartwright, Miss M. W.	North Curry, Taunton	1	1	0
Cartwright, T. G.	30, Beaufort Gardens, London, S.W	1	0	0
†Cary, John	The Priory, Shepton Mallet . . . . .	..	..	..
†Cary, W. H.	Junior Constitutional Club, Piccadilly, London, W.1. . . . .	..	..	..
Cattybrook Brick Co. (Ltd.)	Provident Buildings, 15, Clare Street, Bristol	1	0	0
Cave, Captain A. L.	Sherwood, Newton St. Cyres, Exeter	1	0	0
Cave, Sir C. H., Bart.	Sidbury Manor, Sidmouth	1	0	0
Cave, E. C.	Pacombe, Sidford, Sidmouth, Devon	1	0	0
Cecil, Lt.-Col. R. E., D.S.O.	Passford House, Lymington, Hants.	1	0	0

Name	Residence	Sub- scriptions		
		£	s.	d.
Chapman, W. W.	Mowbray House, Norfolk Street, Strand, London, W.C.2. ..	1	1	0
Chester, J. & Co.	York House, Newmarket. . .	1	0	0
Chichester, Major C. H. ..	Hall, Bishops Tawton, Barnstaple	1	0	0
Chichester, H.	Verberc, Willand, Cullompton ..	1	0	0
†Chick, J. H.	Wynford Eagle, Maiden Newton, Dorset .. .. .	..	..	..
†Chick, W. D.	Compton Valence, Dorchester ..	..	..	..
*Chinneck, W. J.	Trobridge House, Crediton ..	2	0	0
Chivers and Son	Histon, Cambridge	1	0	0
Christie, A. L.	Tapeley Park, Instow, N. Devon	1	1	0
Churchill, The Viscount, G.C.V.O.	Carlton Club, Pall Mall, London, S.W.1.	1	0	0
†Churchward, F.	Hill House, Stoke Gabriel, near Totnes .. .. .	..	..	..
Clare, A. J.	Beach House, Wells	1	0	0
*Clarendon, Earl of	The Grove, Watford	2	2	0
Clark, H.	Keward House, Wells	1	0	0
Clark, H. B.	Butleigh, Glastonbury	1	0	0
*†Clark, J. J.	Goldstone Farm, Hove, Sussex (Hon. Local Sec., 1885) ..	..	..	..
Clark, W. S.	Street, Glastonbury	1	0	0
†Clarke, C. S.	Tracy Park, near Bath .. ..	..	..	..
Clarke, J. W.	Bridwell, Cullompton	1	0	0
Clatworthy, E.	Cutsey, Trull, Taunton	1	1	0
*Clifden, Viscount	Lanhydroc, Bodmin	2	0	0
Clinton, Lord	Heanton Satchville, Dolton, N. Devon.	1	0	0
Clive, Capt. E. A. B. ..	Brympton, near Yeovil, Somerset	1	0	0
Clutton, R. W.	Hartwood, Reigate	1	0	0
Cobb, H. M.	Higham, Rochester	1	0	0
Cobb, R.	Watlynge, near Rochester ..	1	0	0
Cockburn, A. P.	Stanborough, Halwell, S. Devon. .	1	1	0
Cole, J. J. B.	Combe Manor, Hungerford ..	1	0	0
Colebrook, H. J.	Fulmer Hall, Fulmer, Bucks. ..	1	0	0
Coleridge, Hon. G. D. ..	The Chanter's House, Ottery St. Mary, Devon	1	0	0
Collet, Sir Mark, Bart. ..	St. Clare, Kemsing, Sevenoaks ..	1	1	0
Collins, A. H.	Manor Farm, Codford St. Peter, Wilts.	1	0	0
Collins, J. S.	St. George's Lodge, Oldfield Park, Bath	1	1	0
Colman, Sir J., Bart. ..	Gatton Park, Surrey	1	0	0
Colmer, Jas. (Ltd.)	Union Street, Bath	1	0	0
Colston, Lieut.-Col. the - Hon. E.	Hamilton House, Ashburn Place, S.W.7.	1	0	0

Subscriptions.

CXCV

Name	Residence	Subscriptions
		£ s. d.
Colville, H. K.	Hillmarton Lodge, Calne, Wilts. . .	1 0 0
Cook, R.	Widhayes, Tiverton	1 0 0
Cookson, Mrs. Freville	Chute Standen, Andover. . .	1 0 0
Cookson, Miss W.	Highlands, Spencers Wood, Reading	1 0 0
Cooling, G. and Sons	Northgate Street, Bath	1 1 0
Coonan, J. F.	Balmoral House, Mumbles, Swansea	1 0 0
Cooper, Sir G., Bart.	Hursley Park, Winchester	1 0 0
Cooper, Major R. W.	Rush Court, Wallingford. . .	1 0 0
Cope, W.	Southerndown, Glam.	1 1 0
Corbet, E. W. M.	Bute Estate Office, Cardiff	1 1 0
Corbett, S. E.	Perseverance Iron Works, Shewsbury	1 0 0
†Cork and Orrery, The Earl .. ..	.. ..	..
†Corner, H. W. .. ..	.. ..	..
Cornish, Dr.	Pixford, Taunton	1 0 0
†Cornwallis, Col. F. S. W. .. ..	.. ..	..
O.B.E., D.L.	Linton Park, Maidstone .. ..	..
Corp, R.	Woodford Farm, Wells	1 0 0
Cory, Sir Clifford J., Bart., D.L.	Llantarnam Abbey, Mon. . .	1 0 0
Cory W.	Fullerton Manor, Andover	1 0 0
Cory-Wright, Miss B. G.	Ayot Place, Welwyn, Herts. ..	1 0 0
Coryton, Capt. J. T.	Pentillie Castle, St. Martin's, R.S.O.	1 0 0
†Cotterell, Sir J. R. G., Bart.	Garnons, Hereford. . .	..
Cotton, R. W.	Baltonsbrough, Glastonbury ..	1 0 0
Coultrip, A. W.	Norwood Manor, East Church, Kent	1 0 0
Couper, G. R. C.	The Barton, Instow, N. Devon ..	1 0 0
†Courage, Raymond. . .	Shenfield Place, Brentwood, Essex	..
Courtenay, Mrs. P. D. A.	Overmere, Burnham-on-Sea, Som.	1 1 0
Cousins, Chas. . .	Jenkins, Stisted, Braintree, Essex	1 0 0
*Coventry, The Earl of	Croome Court, Worcester. . .	2 0 0
Cowie, G. A.	39, Victoria Street, Westminster, London, S.W.1. . .	1 0 0
Cox, S. V.	Pwlpen Farm, Bishpool, Newport, Mon.	0 10 0
Cox & Sons	47, City Road, Cardiff	1 0 0
Crawford, H. W.	Lloyd's Bank Chambers, Swansea	1 0 0
Criddle, A. M. B.	Worle, Weston-super-Mare	1 0 0
Cridlan, J. J.	Maisemore Park, Gloucester	1 0 0
Croker, W. J. . .	Grapnel Farm, Dinder, Wells ..	1 0 0
Crompton's Pure Salt Brick Co. (Ltd.)	255, Chapel Street, Salford	1 0 0
Cross, F. R.	Worcester House, Clifton. . .	1 1 0
*Cross, Carlton	Wyke Hall, Gillingham	2 0 0
Cross, G.	Smart's Hill House, Penshurst, Kent	1 0 0
Crossman A.	Ivythorn, Street, Somerset	1 0 0

Name	Residence	Subscriptions		
		£	s.	d.
Crowther, F. C. (Co-op Wholesale Society)	1, Balloon Street, Manchester ..	1	0	0
Crutchley, P. E.	Limminghill Lodge, Ascot ..	1	0	0
Cumber, W. J.	Theale, Berks	1	0	0
Cuming, Edwin J.	Langhill, Moretonhampstead, Devon	1	0	0
Cundall, H. M., I.S.O., F.S.A.	4, Marchmont Gardens, Richmond Hill, Surrey	1	0	0
†Curre, E.	Itton Court, Chepstow			
Currie, L.	Minley Manor, Farnborough, Hants	1	0	0
Dairy Supply Company (Ltd.)	Museum St., Bloomsbury, London, W.C.9	1	0	0
Dalby, D. W. (P. C. Henderson, Ltd.)	West Bank Works, Barking, London, E.	1	0	0
Dalrymple, Major F. B.	Bartley Lodge, Cadnam, Hants...	1	0	0
Daniel, F. W. A.	Higher Ford, Wellington, Somt.	1	0	0
†Daniel, H. T.	The Red House, Cannington, Bridgwater			
Darby, A. E. W.	Little Ness, Shrewsbury	1	0	0
Darby, E.	Liscombe, Dulverton	1	0	0
†Darell, D.	Hillfield House, Stoke Fleming, near Dartmouth			
Davey, Sleep & Co. (Ltd.) ..	Excelsior Plough Works, Plymouth	1	0	0
†Davey, T. R.	Wraxall Court, near Bristol			
David & David	Old Bank Chambers, 27, High Street, Cardiff	1	0	0
Davies, D.	"Porth Pean," Queen's Road, Sketty, Swansea	1	1	0
*Davies, D. G.	Fir Grove, Morriston, Swansea ..	2	2	0
Davies, T. W.	The Cefn, Pontypridd	1	0	0
Davies, F. W.	Wesfra, Bishopston, Glam. ..	1	0	0
Davies, M. J... ..	Killay Fach Farm, Killay, Glam.	1	0	0
Davis, E. K.	Little Stoke, Patchway, near Bristol	1	0	0
†Davis, H. J... ..	Sutton Montis, Sparkford, S.O., Somerset			
Davis, & Co.	75, George Street, Oxford	1	0	0
Daw, J. E.	4, Louisa Terrace, Exmouth ..	1	1	0
Dawney, Major-Gen. G. F...	Longparish House, Whitechurch, Hants	1	0	0
Day & Sons (Ltd.)	Crewe	1	0	0
*†Debenham, E. R.	Morton House, near Dorchester ..			
Debenham, H.	Buckland House, Buckland St. Mary, Taunton	1	0	0

Name	Residence	Sub- scriptions
		£ s. d.
De Laval Chadburn Co., Ltd.	Wellington House, Buckingham Gate, London, S.W.1. . .	1 0 0
Denning, & Co.	Chard, Somerset	1 0 0
Denning, R. J.	Little Ashwell Farm, Ilminster . .	1 0 0
Dennis, S.	Latton, Cricklade, Wilts.	1 0 0
†Devas, H. G.	"Nizels," Hildenborough, Tonbridge	..
Devenish, H. N.	Little Dunford, Salisbury	1 0 0
*Devon, The Earl of	Powderham Castle, Devon	2 0 0
Dickinson, W. F.	Kingweston, Taunton	1 0 0
Dickson & Robinson	Cathedral Street, Manchester . . .	1 1 0
*Digby, Capt., The Lord, D.S.O., M.C. (Coldstream Guards)	Minterne, Cerne Abbas	2 0 0
Digby, Major F. J. B. Wing- field, D.S.O.	Sherborne	1 0 0
Dinam, Estates Co.	The Offices, Llandinam, Mont- gomery	1 0 0
†Dobson, H. V.	Bath & County Club, Bath . . . . .	..
Dodington, Lt.-Col. R. M.	Horsington Park, Templecombe . .	1 1 0
Dormer, Capt. C. W. C.	Rousham, Oxford.	1 0 0
Dors, J. C.	Hunters Lodge, Wells	1 0 0
*Douglas, J.	Hanham Road, Kingswood, near Bristol	2 0 0
Dowland, D.	Moorscroft Farm, Lidsing, Chat- ham, Kent	1 0 0
Down, H. E.	Middle Farm, Dinder, Wells	1 0 0
Drummond, Col. F. D. W., C.B.E.	Cawdor Estate Office, Carmarthen . .	1 0 0
Duck, W. G.	Neadwood, Christon, near Exeter . .	1 1 0
Duckworth, Major A. C.	Orchardleigh Park, Frome	1 0 0
Dugdale, Major J. G.	The Abbey, Cirencester	1 0 0
Dugdale, Major W. M.	Llwyn, Llanfyllin	1 0 0
Duncan, R. . . . .	.. . . .	1 0 0
Dunlop, I. M.	Avonhurst, Sneyd Park, Bristol. . .	1 0 0
*Durand, Lady	Hill House, Bridstow, Ross-on- Wye	2 0 0
Eagle Range and Gas Stove Company (Ltd.)	Catherine St., Aston, Birmingham . .	1 0 0
*†Eastwood, J. E.	Wade Court, Havant . . . . .	..
Eaton, G. T.	Thurston Hall, Framfield, Sussex . .	1 0 0
Economic Fencing Company (Ltd.) (Duloken, A. G.)	Billiter House, Billiter Street, London, E.C.3.	1 0 0
Ede, B. M.	Plurrenden, Bethersden, Ashford, Kent	1 0 0
Eden, R. H. H.	Heytesbury, Wilts	1 0 0
†Edmondson, A.	Woodclose, Silverdale, Lancashire . .	..

Name	Residence	Subscriptions		
		£	s.	d.
Edmunds, L.	Cholderton, Salisbury	1	0	0
Edwards, A. P.	Gog's House, Wedmore, Somerset	1	1	0
Edwards, E. W.	Pevnor House, Chesham, Berks.	1	1	0
Edwards, R. G.	Burrington Vicarage, Bristol	1	1	0
Edwards, W. H. G.	Butcombe Court, Wrington	1	0	0
*Edwards-Ker, Lieut.-Col. D. R., O.B.E., M.A.	Principal, Seale Hayne Agricultural College, Newton Abbot	2	0	0
Eldridge, Pope & Co.	Dorchester	1	0	0
Elmhurst Farming and Trading Co., Ltd.	Elmhurst Farm, Slinfold, Sussex	1	0	0
Elton, B. A.	Langford, near Bristol	1	0	0
Elwes, Lt.-Col. H. C., D.S.O., M.V.O.	Colesborne, Cheltenham	1	1	0
Elwes, P. F. C.	Somerton, Somerset	1	0	0
Emmet, Mrs. R.	Moreton Paddox, Moreton Morrell, Warwick	1	0	0
England, W.	Quantock, West Monkton, Taunton	1	0	0
Errington, R.	Victoria Mills, Sunderland	1	0	0
Erskine, Lord, M.P.	Charlton, near Bristol	1	0	0
*Esplen, Sir John, Bart.	Hardres Court, Canterbury	2	0	0
Eustice, G. H.	Bezurrell, Gwinear, Hayle, Cornwall	1	0	0
Evans, E. W.	Crickleaze House, Chard	1	0	0
Evans, H. M. Glynn	Plasissa, Llangennech, Carmarthenshire	1	0	0
Evans, Mrs. D. M.	116, Bryn Road, Swansea	1	1	0
Evans, Miss P. D.	Iscoed, Ferryside, Carm.	1	1	0
Evans, R. P., J.P.	Woodbatch House, Reigate, Surrey	1	0	0
Evans, Thomas	Berkeley Villa, St. James's Garden, Swansea	1	0	0
†Evan-Thomas, Commander A.	Caerwnnon, Builth Wells, R.S.O.			
Evan-Thomas, Vice-Admiral Sir Hugh	Redlap House, Dartmouth	1	0	0
†Eve, Mr. Justice	Royal Courts of Justice, London, W.C.2.			
Evelyn, Mrs.	Wotton House, near Dorking	1	0	0
Everard, W. L., M.P.	Ratcliffe Hall, Leicester	1	0	0
Eyles, T. W.	Ashley Wood, Kingsdown, Box, Wilts	1	1	0
Ezra, E.	Look, Partridge Green, Sussex	1	0	0
*†Falmouth, Viscount	Tregothnan, Truro			
Fane, Major N. H.	Boyton Manor, Codford, Wilts	1	0	0
†Farmer, S. W.	Little Bedwyn, Wilts			

Subscriptions.

cxcix

Name	Residence	Subscriptions		
		£	s.	d.
†Farwell, Major E. W. ..	Hylton Estate Office, Kilmersdon, Bath .. .. .	..	..	..
Fastnut, (Ltd.)	Beehive Wharf, Brentford, Middlesex	1	1	0
Faudel-Phillips, Major H. ..	.. .. .	1	0	0
Feaver, A.	Coal, Cake and Corn Merchant, Evercreech	1	0	0
Fenton, A. D... ..	Maristow, Roborough, S. Devon..	0	10	0
Fenwick, M.	Abbotswood, Stow-on-the-Wold..	1	1	0
*Ferguson-Davie, Sir W.J., Bt.	Creedy Park, Crediton	2	0	0
Ferrand, G. F.	Clanville Lodge, Andover, Hants.	1	0	0
Ferriman, W. R.	Bower Ashton, Bristol	1	0	0
Fewtrell, O. J.	Estate Office, Wells	1	0	0
Firth, Capt. C. P. L. ..	Compton Durville Manor, South Petherton, Somerset	1	0	0
Fison, J. & Co.	Ipswich	1	0	0
*Fitzgerald, Lady	Buckland, Faringdon, Berks ..	2	0	0
Fitzwalter, Lord	Goodnestone, Dover	1	0	0
Fitzwilliams, Col. E. C. L..	.. .. .	..	..	..
C.M.G.	Brynteffi, Pentrecourt, Llandyssul	1	0	0
Flemming, Lt.-Col. Gordon..	Winsley House, Bradford-on-Avon	1	1	0
Fletcher, Capt. A. M. T. ..	Margam Park, Port Talbot ..	1	0	0
Flower, James	Chilmark, Salisbury	1	0	0
*†Folkestone, Viscount ..	Longford Castle, Salisbury ..	..	..	..
*Follett, J. S.	Hemyock Place, Hemyock ..	2	0	0
*†Forester, Capt. F. W. ..	Saxilbye Park, Melton Mowbray..	..	..	..
Forshaw, W. H.	Slythehurst, Ewhurst, Guildford	1	0	0
Forster, J. C... ..	Clatford Mills, Andover	1	0	0
Fortune, R.	Newhouse, Cranleigh, Surrey ..	1	0	0
†Fortesque, J. B.	Boconnoc, Lostwithiel, Cornwall	..	..	..
Four Oaks Spraying Machine Co. (Ltd.)	Four Oaks Works, Sutton Coldfield	1	0	0
Fowler & de la Perrelle ..	Porter's Lane, Southampton ..	1	0	0
Fowler, J & Co. (Ltd.) ..	Leeds	1	0	0
Fox, Brothers & Co.	Wellington, Somerset	1	1	0
Fox, C. L.	Rumwell Hall, Taunton	1	0	0
Fox, Mrs. A.	Brislington House, near Bristol ..	1	0	0
Fox, R. A.	Yate House, Yate, Glos.	1	1	0
Foxcroft, C. T., M.P. ..	Hinton Charterhouse, Bath ..	1	1	0
*Fremlin, W. T.	Milgate Park, Maidstone	2	0	0
French, W. T. and Son ..	St. Mary Street, Ladywood, Birmingham	1	0	0
Frost, E. J.	Fountain Farm, Dulcote, Wells ..	1	1	0
Fry, A. M.	8, Zion Hill, Clifton, Bristol ..	1	1	0
Fry, Cecil	Grove House, Frenchay, Bristol..	1	0	0
Fry, C. A. H.	Ashton Lodge, Long Ashton, Bristol	1	0	0
Fry, H. A.	Monmouth Place, Bath	1	1	0
*Fry, J. S. & Son (Ltd.) ..	Union Street, Bristol	2	2	0

Name	Residence	Sub- scriptions			
			£	s.	d.
Fryer, W. J.	Holme Park, Sonning, Berks.	1	1	0	0
†Fuller, G. Pargiter	Neston Park, Corsham . . . . .	..	..	..	..
*Fuller, Major R. F.	Great Chalfield, Melksham, Wilts	2	0	0	0
Fuller, Mrs. R. F.	Great Chalfield, Melksham, Wilts	1	0	0	0
Fuller, S. & A.	Bath	1	0	0	0
Fullwood and Bland	31-35, Beviden Street, Hoxton, London, N.	1	0	0	0
Fursdon, E. S.	The Elms, Alphington	1	1	0	0
Gale, G.	The Grove, Winterbourne, near Bristol	1	0	0	0
Galloway, J.	Holmsted Manor, Cuckfield, Sussex	1	1	0	0
Gane, P. J.	Higher Rocke Farm, Butleigh, Glastonbury	1	0	0	0
Gantlett, W. R. & Son	Manor Farm, Fairfield, Glos.	1	1	0	0
Gardiner, Sons & Co.	Nelson Street, Bristol	1	1	0	0
Garne, W.	Aldsworth, Northleach	1	1	0	0
Garne, W. T.	Aldsworth, Northleach	1	1	0	0
Garrett, W.	Backwell Hill House, West Town, R.S.O., Somerset	1	0	0	0
Garton, J. A.	Pylle Manor, Shepton Mallet, Somerset	1	0	0	0
Genge, M.	Stop Farm, Fonthill Gifford, Tisbury	1	1	0	0
Gibbins, T.	Glynfelin, Neath	1	0	0	0
†Gibbons, H.	The Model Farm, King's Langley, Herts. . . . .	..	..	..	..
Gibbons, P. F., J.P.	Keynsham	1	1	0	0
†Gibbs, Major A. H.	Pytte, Clyst St. George, Exeter . . . . .	..	..	..	..
†Gibbs, Mrs.	Pytte, Clyst St. George, Exeter . . . . .	..	..	..	..
*†Gibbs, Col. The Right Hon. George A., M.P.	Tyntesfield, Bristol . . . . .	..	..	..	..
†Gibbs, H. M.	Barrow Court, Flax Bourton, Bristol . . . . .	..	..	..	..
Gibbs, Rev. J. S., M.C.	The Vicarage, Badminton	1	0	0	0
Gibbs, Lt.-Col. W. O.	Home Farm, Barrow Gurney	1	0	0	0
†Gibbs, Mrs. W. O.	Home Farm, Barrow Gurney . . . . .	..	..	..	..
Gibson, J. T.	Warren House, Wrington	1	1	0	0
Gifford, G.	Lyde Green, Pucklechurch, Bristol	1	0	0	0
Gill, F. C.	Westland, Farm, Challacombe, Devon	1	0	0	0
Gillingham, J. & Son	Prospect House, Chard	1	0	0	0
Gisborne, Col. L., C.M.G.	Lingen Hall, Brampton Bryan	1	0	0	0
†Gladstone, J.	Bowden Park, Chippenham . . . . .	..	..	..	..
Glanely, Lord	Lackham, Lacock, Wilts.	1	0	0	0
Glanville, F.	Poplar Farm, Westbury-sub-Men- dip, Wells	1	0	0	0
Glencross, T.	The Paddocks, Stoke Gifford	1	1	0	0

Name	Residence	Subscriptions
		£ s. d.
Glover, J. H.	Cornwood, S. Devon	1 0 0
Glyn, Capt. Sir R. F., Bart.		1 0 0
Godfrey, J. B.	Downside Farm, Shepton Mallet..	1 0 0
†Godman, C. B.	Woldringfold, Horsham .. ..	..
Godman, J.	The Raswells, Hascombe, God- alming	1 0 0
Godwin, Warren and Co., (Ltd.)	140, Redcliffe Street, Bristol ..	1 0 0
Goemans, H. E.	Foxbury Estate Office, Chisle- hurst, Kent	1 1 0
†Goldney, Sir Prior, Bart., C.B.	Derriads, Chippenham .. ..	..
Goodchild, G. A.	The Oak House, Great Yeldham, Essex	1 1 0
Goodden, J. R. P.	Compton House, Sherborne ..	1 0 0
Goodman, A. & Sons	3, Hammett Street, Taunton, and Broad St. House, London, E.C.	1 0 0
*Gordon, Major R.G.S., M.C.	Langton House, Blandford ..	2 0 0
Gordon, G. H.	The Barn House, Sherborne ..	1 0 0
Goring, C.	Wiston Park, Steyning	1 0 0
†Gorringe, Hugh	Kingston-by-Sea, Brighton ..	..
Gosling, R. H.	Hawthorne Hill, Bracknell ..	1 1 0
Grace, A.	39, Welsh Back, Bristol	1 1 0
Graham, J. C.	Clwyd Hall, nr. Ruthin, N. Wales	1 0 .
Graham-Clarke, Capt. J. E. H.	Frouston Manor, Stonehouse, Glos.	1 0 0
Grant-Ives, C. E.	Bradden House, Towcester, North- amptonshire	1 0 0
Grant, W. J.	42, Llanthewy Rd., Newport, Mon.	1 0 0
Gray, R.	The Estate Office, Sherborne ..	1 0 0
Greaves, R. M.	Wern, Portmadoc, North Wales..	1 0 0
Green, A. W.	Stoke Abbey Farm, Stoke Bishop, Bristol	1 0 0
†Green, Major H. L.	The Hall, Poulton Lanulyn, Bromborough, Cheshire ..	..
†Greenall, Mrs. C. E.	The Manor, Carlton Scroop, Grantham .. ..	..
†Greenall, Sir G., Bart.	Walton Hall, Warrington ..	..
Greenway, W.	Halse, Taunton	1 0 0
Greenwell, Sir B., Bart.	Marden Park, Woldingham, Surrey	1 0 0
Greenwood, J. C.	Westfield Farm, Bloomfield Road, Bath	1 0 0
Gregory, W.	Wellington, Somerset	1 1 0
†Guest, Miss.	Inwood, Templecombe .. ..	..
*Guilford, Earl of	Waldershare Park, Dover ..	2 0 0
Guille, H. C. de Stevens	Westleigh House, Westleigh, near Bideford, N. Devon	1 0 0
Gullick, W. F., F.R.H.S.	Waterloo Nursery, Salisbury ..	1 0 0
Gunther, C. E.	Tongswood, Hawkhurst, Kent ..	1 0 0

Name	Residence	Subscriptions		
		£	s.	d.
Hall, R. G.	Ferry House, Bere, Alston ..	1	0	0
*Hambleton, Viscount ..	Greenlands, Henley-on-Thames ..	5	0	0
*Hambro, Sir E. A., K.C.V.O.	Hayes Place, Kent	2	0	0
Hambro, H. C.	The Lodge, Tadworth, Surrey ..	1	0	0
Hamilton, Capt. C. E. ..	Weston, Newark-on-Trent ..	1	0	0
Hancock, H. C.	The Court, Milverton, Taunton ..	1	0	0
Hancock, Mrs. R. D. ..	Halse, Taunton	1	0	0
Handcock & Stinchcomb ..	69, Queen Square, Bristol ..	1	0	0
Harbottle, E. H.	Topsam, Devon	1	0	0
Harding, E.	Packwood Grange, Dorridge ..	1	0	0
Harding, E. G.	Foxcote, Grittleton, Chippenham ..	1	0	0
Harditch, J. A.	Shipway Gate Farm, Portbury, Bristol	1	0	0
Hardwick, A.	Easton in Gordano, Bristol ..	1	0	0
Hare, Lady K. F.	Brokenhurst Park, Hants ..	1	0	0
Harey, A. M.	Swanmore, Staplehay, nr. Taunton ..	1	0	0
Harmsworth, V. G.	Valley Holme, Horsted Keynes, Sussex	1	0	0
Harris, H.	Singleton Park Farm, Sketty, S.O., Glam.	1	0	0
Harris, J.	Wistland Road, Kentisbury, North Devon	1	0	0
Harrison, D.	The Grove, Tenby	1	0	0
Harrison, McGregor & Co. ..	Leigh, Lancashire	1	0	0
Harrop, Capt. W. M. ..	Gwersyllt Hill, Wrexham	1	0	0
Hart, W. H.	Home Farm, Biddestone, Chippenham	1	0	0
Hartley, Major H. B. ..	Tytherington, Heytesbury, Wilts. ..	1	0	0
Haward, T. W.	Grove House, West Derby, Liverpool	1	1	0
Hawker, Capt. H. G. ..	Strode, Ermington, Ivybridge ..	1	0	0
Hawkins, A. W. Bailey ..	Stagenhoe Park, Welwyn, Herts. ..	1	0	0
†Haydon, Lt.-Col. W. H. ..	Maidford, Malmesbury, Wilts ..	..	..	..
Hayes-Sadler, Mrs. A. F. ..	Little Hallingbury Park, Bishop's Stortford, Essex	1	0	0
Hayes, F. J.	West Pennard, Glastonbury ..	1	0	0
Heathcoat-Amory, Sir I. M., Bart.	Hensleigh, Tiverton, Devon ..	1	0	0
Heylar, Comm. K. C., D.S.O.	Poundesford, Taunton	1	0	0
*†Henderson, Lieut.-Col. Hon. H. G.	Buscot Park, Faringdon, Berks ..	..	..	..
Henderson, P. C. (Ld.) ..	West Bank Works, Barking, London	1	0	0
Heneage-Vivian, Rear Admiral Walter	Parc le Breos, Penmaen, Glam. ..	1	0	0
Henry, Lt.-Col. F.	Elmstree, Tetbury	1	0	0
Heppel, E. M.	Camerton, near Bath	1	1	0

Name	Residence	Sub-
		scriptions
		£ s. d.
Heseltine, Lt.-Col. J. E. N. . .	Hawking Down Farm, Hindon, Salisbury	1 0 0
Hesse, F. W.	Weston Hill, Weston Park, Bath	1 0 0
†Hewitt, G. Southby	Day, Son & Hewitt, 22, Dorset Street, London, W.1. . . . .	..
Hick, W. A.	Wayfield, Batheaston, Bath . .	1 0 0
Hicks-Beach, Lady Susan . .	Coln S. Aldwyn, Fairford, Glos. .	1 0 0
Hickton, J. W.	Bellbroughton, Stourbridge . .	1 0 0
Higgins, B.	Millhouse Farm, Evercreech . .	0 10 0
Higgins, Lawrence C. . . .	Butleigh, Wootton House, Glas- tonbury	1 0 0
Higgins, W. A.	11, York Street, Swansea	1 0 0
Hignett, G.	Hodshill, Southstoke, Bath . .	1 1 0
Hignett, Mrs. G.	Hodshill, Southstoke, Bath . .	1 1 0
†Hill, B. H.	Uphill, Weston-super-Mare . .	..
Hill, H.	Paulton, near Bristol	1 1 0
Hill, C. L.	Harptree Court, East Harptree, near Bristol	1 0 0
Hill, H. N.	High Street, Newmarket	1 0 0
Hill, S.	Langford House, Churchill, Bristol	1 0 0
Hill, Major V. T.	Woodspring Priory, near Weston- super-Mare	1 1 0
Hill, Mrs. V. T.	Woodspring Priory, nr. Weston- super-Mare	1 0 0
†Hinckes, Captain R. T. . .	Mansel Court, Mansel Lacey, Hereford . . . . .	..
Hippisley & Sons	Wells, Somerset	1 0 0
Hippisley, R. J. B.	Ston Easton Park, Bath	1 0 0
Hiscock, Victor	France Farm, Blandford	1 1 0
†Hoare, Sir H. H. A., Bart. .	Stourhead, Zeals, S.O., Wilts . .	..
Hobhouse, A. L.	Hadspen House, Castle Cary, Somt.	1 0 0
†Hobhouse, R. A.	Pondmead, Oakhill, Somerset . .	..
*Hobhouse, Rt.-Hon. H. . .	Hadspen House, Castle Cary . .	2 0 0
†Hoddinott, S.	Dean Vale, West Cranmore, Shepton Mallet . . . . .	..
Hodgson, W. F. S.	Morebath, Bampton, Devon . .	1 0 0
Holford, Mrs. Gwynne . . .	Buckland, Bwlch, Breconshire . .	1 0 0
Holland, J. H.	Peene House, Newington, Shorn- cliffe Camp, Kent	1 0 0
Hollingshurst, H.	41, Trinity Sq., London, E.C.3. .	1 0 0
Holmes, J. V.	Penyfa, Llanelly, Carmarthenshire	1 1 0
Holt Needham, O. N. . . .	Barton Court, Colwall, nr. Malvern	1 0 0
†Holt Thomas G.	North Dean House, Hughendon, Bucks . . . . .	..
Hood, Capt. A. C.	Buckhill House, Calne	1 0 0
Hooley, Terah F.	Dry Drayton, Cambridge	1 0 0
Hooper, Bros.	Newburgh, Winfrith, Dorchester	1 0 0
†Horner, Sir. J. F. Fortescue	Mells Park, Frome . . . . .	..

Name	Residence	Subscriptions		
		£	s.	d.
Hort, J. F.	Hallen, Henbury, nr. Bristol . .	1	0	0
Horton-Starkie, Rev. Preb. Le G. G.	Wellow Vicarage, Bath	1	1	0
Hosegood, A. W.	Williton, Taunton	1	0	0
Hosking, W. L.	Fentongollan, Probus, Cornwall	1	0	0
Hotson, H. (Wolseley Sheep Shearing Mach. Co., Ltd. . .	Alma Street, Birmingham . . .	1	0	0
House, V. J.	Walcombe, Wells	1	0	0
Howard, A. H. S.	Thornbury Castle, Gloucester . .	1	0	0
Howard, J. & F.	Bedford	1	0	0
Howard, Mrs. R.	New Copse, Medstead, Hants. . .	1	0	0
†Hughes, A. E.	The Laurels, Bargates, Leominster	..	..	..
Humphries, Sir Sidney, J.P.	Eastfield Lodge, Westbury-on- Trym, Bristol	1	1	0
Huntington, Major A. W. . .	Wellesbourne House, Warwick . .	1	0	0
†Hurle, J. C.	Kilve Court, Bridgwater . . . .	..	..	..
Hurle, Major J. A. Cooke . .	Yarlington House, Wincanton . .	1	0	0
Hurst & Son	152, Houndsditch, London, E.1 . .	1	0	0
*Hussey, A. H.	Maincombe, Crewkerne	2	0	0
Hussey, T.	Manor Farm, Coxley, Wells . . .	1	0	0
Hussey, Captain H.	Maincombe, Crewkerne	1	0	0
Hutton, K. M.	East Farm, Affpiddle, Dorset . .	1	1	0
Huxtable, J. & Co.	Alexandra Works, Barnstaple . .	1	0	0
†Hylton, Lord	Charlton, near Radstock . . . .	..	..	..
*Ilchester, Earl of	Melbury, Dorchester	2	2	0
Iles, D.	Lyegrove, Badminton	1	0	0
Imbert-Terry, F. B.	Blue Hayes, Broadclyst, Devon . .	1	0	0
Imbert-Terry, Mrs. L.	Blue Hayes, Broadclyst, Devon . .	1	0	0
Imperial Live Stock Insur- ance Co.	27, Cavendish Sq., London, W1.	1	0	0
International Harvester Co. (Ltd.)	80, Finsbury Pavement, London, E.C.	1	0	0
*Ismay, J. H.	Iwerne Minster, Blandford, Dorset	2	0	0
Jackman, Percy	Pulteney Hotel, Bath	1	0	0
Jackson, Sir Henry Mather . .	Llantillio Court, Abergavenny . .	1	0	0
James, A.	Totterdown, Bristol	1	0	0
James, Mark	Home Farm, Ston Easton, Bath . .	1	0	0
James, W.	10, Portland Street, Swansea . .	1	1	0
Jarman, T. M.	Haseley Iron Works, Tetworth . .	1	1	0
Jenkins, D.	Boverton Place, Llantwit Major, Glam.	1	0	0
Jenkins, E.	c/o F. Capern, Lewin's Mead, Bristol	1	0	0

Subscriptions.

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Name	Residence	Sub- scriptions		
		£	s.	d.
Jenkins, T. E. . . .	Kilvrough Home Farm, Park Mill, S.O., Glamorgan	1	0	0
Jenkins, Captain Vaughan	St. Winifreds, Combe Down, Bath	1	0	0
Jenkins, W. A.	Tuxeds, Eaton Grove, Swansea	1	0	0
Jenks, Shirley H.	Elmore, Thorncombe, near Chard	1	1	0
†Jervoise, Mrs. B. A. L.	Herriard Park, Basingstoke . . . .	..	..	..
Jervoise, Major F. H. T.	Herriard Park, Basingstoke	1	1	0
Jewell, Mrs. Eva	Henden Manor, Ide Hill, Seven- oaks, Kent	1	1	0
Jeyes' Sanitary Compounds				
Company	Cannon Street, London, E.C.4. . . .	1	0	0
John, T. D.	The Hollies, Lisvane, Glam. . . .	1	0	0
John, W. H.	High Street, Cowbridge, Glam. . . .	1	0	0
John, W. Llewellyn	Penmount, Llanelly, Carm. . . .	1	1	0
Johns, W. B.	Clinton Estate Office, Dolton, N. Devon	1	1	0
Johnson, L. C.	Peppers, Ashurst, Steyning, Sussex	1	0	0
Johnstone, F. E.	Small Hythe, Tenterden, Kent	1	0	0
Johnstone, G. H.	Trewithen, Grampound Road, Cornwall	1	0	0
Jones, A.	Bowcott Farm, Wotton-under- Edge, Glos.	0	10	0
Jones, E.	Penybont Farm, Sennybridge, Brecon	1	0	0
†Jones, H. G.	Downford, Mayfield, Sussex . . . .	..	..	..
Jones, K. S.	Norton Nouse, West Cross, Swansea	1	0	0
Jones, T. S.	Frondez, Radyr, Cardiff	1	0	0
Jones & Son	Tolbury Mills, Bruton	1	1	0
Joyce, J.	Milverton, Somerset	1	0	0
Joyce, Rev. W. W.	Charles Parsonage, South Molton	1	0	0
*Kearse, A. A.	Manor Farm, Latton, Cricklade, Wilts	2	2	0
Keen, R. L.	Furlong Farm, Westbury-sub- Mendip, Wells	1	0	0
Keen, R. T.	Furlong Farm, Westbury-sub- Mendip, Wells	1	0	0
Kekewich, Sir T. H., Bart.	Peamore, Exeter	1	0	0
Kell & Co.	Gloucester	1	0	0
Kelway, W.	Huish Episcopi, Langport	1	1	0
Kemble, Miss M. I.	Wraxall Manor, Dorchester	1	1	0
†Kemp, L. J.	Maer, Exmouth . . . . .	..	..	..
Kendall, W. G.	Yarner, Darlington, Totnes, S. Devon	1	0	0
Kennaway, Sir J., Bart.	Escot, Ottery St. Mary	1	0	0
Kenward, E.	Axford Lodge, near Basingstoke	1	0	0
Kenyon-Slaney, Major, M.P.	Bridestow, Devon	1	0	0

Name	Residence	Sub- scriptions		
		£	s.	d.
Kerr, R. J.	Church House, Yeovil, Somerset	1	0	0
Kerry Estates Ltd.	Estate Office, Warren House, Stanmore, Middlesex	2	0	0
*Keyser, C. E.	Aldermaston Court, Reading ..	1	0	0
Kidner, S., O.B.E.	Bickley, Milverton, near Taunton	1	0	0
Kidston, G.	Hazlebury, Box, Wilts	1	0	0
Killen, C. J.	Middle Farm, West Horrington, Wells	1	0	0
Killen, J. J.	Rood Farm, Butleigh, Glastonbury	1	0	0
Killen, R. H.	Manor Farm, Farrington Gurney, Bristol	1	0	0
King, Mrs. A. C.	Braishfield Pony Stud, Romsey, Hants	1	0	0
King, E. A.	Proudcross Farm, East Harptree, near Bristol	1	0	0
King, E. W.	Chew Magna, near Bristol ..	1	0	0
King & Sons, R.	Milsom Street, Bath	1	1	0
Kingsclere Farms and Stud (L. A. Ormrod)	Kingsclere, Hants	1	1	0
Kingwell, H. J.	Bow Grange, Totnes	1	0	0
Knight-Bruce, R.	The Sanctuary, Shobrooke, Crediton	1	0	0
Knight, S. J.	Buckingham Lodge, Keynsham, Bristol	1	0	0
†Knollys, C. R.	Richmond Lodge, Richmond Hill, Bath	1	1	0
Knox, E.	Richmond Grove, Bath	1	1	0
†Kruise, W.	St. Blazey, Par Station, Cornwall	..	..	..
†Lake, C.	Glenthorne, Gravesend .. ..	..	..	..
Lake, H.	Combe Lancey, Crediton, Devon	1	0	0
Lander, J.	Lydney Park, Gloucester ..	1	1	0
Langford, E. W. (Ltd.)	Hereford	1	0	0
*Lansdowne, Marquis of	Bowood, Calne	2	0	0
†Latham, T.	The Limes, Westwood Road, Tile- hurst, Reading .. ..	..	..	..
Laurie, A. Dyson	Stone Street Farm, Sevenoaks ..	1	0	0
Lawes, Algernon (Ltd.)	203, Hornsey Road, London, N.7	1	1	0
Lawrence, Lt.-Col. the Hon. G.	Hill Farm, Oaksey, Wilts ..	1	0	0
Lawrence, R.	Rull, Cullompton, Devon ..	1	0	0
Lawton, W.	Kindatt, Penn Lea Road, Bath ..	1	0	0
Laye, Captain R.	The Warren, Wotton-under-Edge, Glos.	1	0	0
Lean, J. E.	21, Victoria Square, Truro ..	1	0	0
Leeder, E. H.	Mount Pleasant House, Swansea ..	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Leitrim, Earl of	Court Lodge Farm, Teston, Maidstone	1	1	0
Leverton, W. A.	Columb John Farm, Stoke Canon, Exeter	1	0	0
Lewis G. C.	3, Temple Buildings, Goat Street, Swansea	1	1	0
Lewis, Miss E.	Ffrwdydrain, Llandilo	1	0	0
Lewis, Col. H.	Green Meadow, near Cardiff	1	1	0
Lewis, Wm. & Son (Ltd.) ..	Herald Office, Bath	1	0	0
Lewis, W.	Langstone Court, Newport, Mon. ..	1	0	0
Lewisham, Lord	Godmersham Park, Canterbury ..	1	0	0
†Ley, John Henry	Trehill, Exeter .. ..	..	..	..
Liddell, Capt. C. O.	Shire Newton Hall, Chepstow ..	1	1	0
Liddon, E., M.D.	Silver Street House, Taunton ..	1	0	0
Lindley, Hon. Walter Barry	Corpe House, Taunton	1	0	0
Lindley, Hon. Mrs. Walter ..	Corpe House, Taunton	1	0	0
Lipscomb, Godfrey	Claverton Lodge, Bathwick Hill, Bath	1	0	0
Lister, R. A. & Co. (Ltd.) ..	Dursley, Glos.	1	1	0
†Lister, J. J.	Falkland House, Lewes .. ..	..	..	..
Littleton, W. J.	Holland Barton, Bodmin, Cornwall	1	0	0
Llewellyn, Capt. Llewellyn T. E.	Hackwood, Basingstoke	1	0	0
Llewellyn, Griffiths R. P. ..	Combend, Elkstone, Colesborne, S.O.	1	0	0
*Llewellyn, Sir J. T. D., Bart.	Penllergaer, Swansea	2	2	0
Long, Col. William	Newton House, Clevedon, Somerset	1	0	0
Long, W. F.	Broadway House, Chilcompton, near Bath	1	0	0
Longrigg, G. E.	Weston Lea, Bath	1	0	0
Lopes, Sir H. Y. Buller, Bart.	Maristow, Roborough, Devon ..	1	0	0
Lord Wandsworth Agricultural College ..	Long Sutton, Winchfield, Hants ..	1	1	0
Loxton, A. H.	Croft Farm, Westbury-sub-Mendip, Wells	1	0	0
Luckes, S.	Bridge Street, Taunton	1	1	0
Luckock, E. H. M.	Sidbrook House, Taunton	1	0	0
Ludlow, Lady	Luton Hoo, Luton	1	0	0
*Luff, J. Purnell	The Towers, Evercreech, Bath ..	2	2	0
Lupton, Miss A.	Chalmington, Dorchester	1	1	0
†Lupton, N. D.	Chalmington, Cattistock, Dorset ..	..	..	..
†Lutley, J. H.	Brockhampton, Worcester .. ..	..	..	..
Luttrell, Major A. C.	Lea Combe House, Axminster ..	1	1	0
Luttrell, Capt. A. F.	Court House, East Quantoxhead, Bridgwater	1	0	0
Luttrell, Claude M. F. ..	Ben Mead, Box, Wilts	1	1	0
Luttrell, G.	Dunster Castle, Somerset	1	1	0
Lyell, Mrs. A. C.	Mayville, Neston, Cheshire	1	0	0
*Lysaght, G. L.	Chapel Cleeve, Taunton	2	0	0

Name	Residence	Sub- scriptions		
		£	s.	d.
Macdonald, H. L. S.	Avondale, Bathford, Bath	1	0	0
Macintosh, J.	The University College, Reading	1	0	0
Maddever, J.	Erth Barton, Saltash	1	1	0
Maitland, A.	Thornleigh, Vicars Cross, near Chester	1	0	0
Major, H. J. & C. (Ltd.)	Bridgwater	1	0	0
Malet, Col. Sir Harry	Wilbury, Newton Tony, Salisbury	1	0	0
†Mansell, A. E.	Mount Vernon, Melton Mowbray, Tasmania	...		
Mansfield, Mrs. E.	Winterbourne Court, Winterbourne, Glos.	1	0	0
Mansfield, T.	Winterbourne Court, Winterbourne, Bristol	1	1	0
Mapstone, R. G.	Glastonbury	1	0	0
Marfell, R. H.	Great House Farm, Llangeview, Usk	1	1	0
Marshall, H. C., C.C.	Wrighton, Somerset	1	0	0
Marshall, L. H.	Chippenham	1	0	0
Marshall, Sons & Co. (Ltd.)	Brittania Iron Works, Gains- borough	1	0	0
Martin, Col.	Bishops Caundle, Sherborne	1	0	0
Martin, Mrs.	Bishops Caundle, Sherborne	1	0	0
Martin, J.	Thorverton, R.S.O., Devon	1	0	0
Martin, T. L.	Ashe Warren, near Basingstoke	1	0	0
Martin, W. P.	Colleton, near Chulmleigh	1	0	0
Martineau, H. M.	The Lodge, Holyport, Berks.	1	0	0
Martyn, G.	Tremeddan, Liskeard, Cornwall	1	1	0
Mason, F. F.	Swansea	1	0	0
Massey-Harris Co. (Ltd.), (G. W. Dawkins, General Manager)	54 & 55, Bunhill Row, London, E.C.1	1	0	0
Masters, A.	Kyneton, Thornbury, Glos.	1	0	0
Mathews, Ernest	Little Shardeloes, Amersham, Bucks	1	0	0
Matthews, H.	Winterbourne, Bristol	1	0	0
Maunder, J.	Kingweston, Somerton	1	0	0
Maunder, L. T.	Butleigh, Glastonbury	1	0	0
May, E. Howard, o/o May and Hassell (Ltd.)	Baltic Wharf, Bristol	1	0	0
Meddick, William G.	Fairfield Arms, Fairfield Pk., Bath	1	0	0
Membery, R.	37, Southgate Street, Bath	1	0	0
Merry, Richard	Goulds, Broadclyst, Exeter	0	10	0
Merryweather & Sons., Ltd.	Greenwich Road, London, S.E.10	1	1	0
Merson, T. H.	Faringdon, N. Petherton, Bridg- water	1	0	0
*Methuen, General Lord, C.B., C.M.G.	Corsham Court, Wilts	2	0	0
*Methuen, Hon. Paul	Beanacre Manor, Melksham	2	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Mevrick, Sir G. . . .	Hinton Admiral, Christchurch, Hants.	1	0	0
*Mildmay, Lord	Flete, Ivybridge, S. Devon	2	2	0
Mildmay, Major G. St. John	Queen Camel, Somerset	1	1	0
†Mildred, G. B. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
†Miles, Lieut.-Col. Sir Charles W., Bart	The Manor House Walton-in-Gordano, Clevedon . . . . .	. . . . .	. . . . .	. . . . .
Miles, H.	Auctioneer, Farrington Gurney, Bristol	1	0	0
Millard, A. A.	Pearash Farm, Penselwood, Bourton, Dorset	1	1	0
Millard, F. J.	Bridge Farm, Butleigh, Glastonbury	1	0	0
Miller-Hallett, A.	Goddington, Chelsfield, Kent	1	1	0
Mills, B. W.	31, Cambridge Place, Paddington, London, W.	1	0	0
Mitchell, Major F. A.	Doughton House, Tetbury, Glos.	1	0	0
Mogg, B. D.	Cherry Orchard Farm, Wells	1	0	0
Molassine Co. (Ltd.)	East Greenwich, London, S.E.	1	0	0
Mond, Sir Alfred, Bart., M.P.	Melchet Court, Romsey	1	0	0
Moody, C.	Maisemoor, Evercreech	1	0	0
Moody, G. W.	Stapleton, Martock, Somerset	1	0	0
Moore, G.	Folly Farm Polsham, Wells	1	0	0
†Moore, H. F.	Renée House, 48, Dulwich Road, Herne Hill, S.E.24 . . . . .	. . . . .	. . . . .	. . . . .
Moore, M. H.	The Hellyers, Ipplepen, Newton Abbot	1	1	0
†Moore-Stevens, J. R. C.	Woodhayes, Whimble, Devon . . . . .	. . . . .	. . . . .	. . . . .
Moore-Stevens, Col. R. A.	Woodhayes, Whimble, Devon	1	0	0
Morcom, Mrs. F. I.	Clock House, Bromsgrove	1	0	0
Morel, C. E. . . . .	. . . . .	1	0	0
Morgan, Bros.	Henlade Farm, Taunton	1	0	0
Morgan, Major L. H. C.	Woolcombe, Wellington, Somerset	1	0	0
Morland, J. C.	The Orchard, Street, Somerset	1	0	0
*Morley, Earl of	Saltram, Plympton, Devon	2	0	0
*Morris, C.	Highfield Hall, St. Albans	2	0	0
Morris, C.	East Lydeard Farm, Bishop's Lydeard, Taunton	1	0	0
Morris, Capt. T. R.	Sketty Park, Sketty, R.S.O., Glam	1	0	0
Morris and Griffin (Ltd.)	Maindee, Newport, Mon.	1	1	0
Morris, Sir R. A. Bart.	Sketty Park, Swansea	1	0	0
Morris, Son and Peard	Auctioneers, North Curry, Taunton	1	0	0
Morrison-Bell, Col. E. F.	The Close, Tetbury, Glos.	1	0	0
*†Morrison, Hugh, M.P.	Fonthill House, Tisbury, Wilts . . . . .	. . . . .	. . . . .	. . . . .
Morrison, Major J. A., D.S.O.	Berwick House, Hindon, Salisbury	1	0	0
†Morrison, J. A.	Basildon Park, Reading . . . . .	. . . . .	. . . . .	. . . . .
Mortimer, Capt. A. E.	Wall's Court, Stoke Gifford, near Bristol	1	0	0
Mortimer, Major M. W.	Longleat Estate Office, Warminster	1	1	0

Name	Residence	Sub- scriptions		
		£	s.	d.
Mount-Edgecumbe, Earl of ..	Mount Edgecumbe, Devonport ..	1	1	0
*Munn, F. S.	Dumballs Road, Cardiff	2	0	0
Muntz, Mrs. J. O.	Foxhams, Horrabridge, S. Devon	1	0	0
Murch, J.	Charlton Mackrell	1	0	0
Murray Smith, Hon. Mrs. ..	Gumley Hall, Market Harborough	1	0	0
Nagle, J.	Amesbury, Wilts	1	1	0
Napier, H. B.	Ashton Court Estate Office, Long Ashton, Bristol	1	1	0
Napier, Capt. W. E.	Upton House, nr. Sandwich, Kent	1	0	0
Neagle, D. T.	London, Gloucester and N. Hants Dairy Co. (Ltd.), 25, Whatley Road, Clifton, Bristol ..	1	0	0
Neal, W. H.	Yealmpstone Farm, Plympton ..	1	1	0
Neeld, Sir A. D., Bart., C.B. ..	Grittleton, Chippenham	1	0	0
Nelder, C. W.	Carnarvon Arms, Dulverton, Somerset	0	10	0
†Neville, Lieut.-Commander Ralph, R.N.	Butleigh, Glastonbury .. ..	..	..	..
†Neville-Grenville, Robert ..	Butleigh Court, Glastonbury ..	..	..	..
New, H. G.	Craddock, Cullompton, Devon ..	1	0	0
Newington, C.	Oakover, Ticehurst, Sussex ..	1	0	0
Newman, Sir R. H. S., Bart., D.L., M.P.	Mamhead Park, near Exeter ..	1	1	0
Nicholetts, E. C.	The Lons, Bitton, Gloucestershire	1	0	0
Nichols, G.	Demarara House, Colston Avenue, Bristol	1	0	0
Nicholson, R. F.	Woodcott, Whitechurch, Hants ..	1	0	0
Nicholls, A. W.	Lorna Doone Rustic Works, Barn- staple	1	0	0
Nix, J. A.	Tilgate, Crawley, Sussex	1	1	0
Nixon, W.	The Cottage, Offchurch, Leamington	1	0	0
*Normanton, Earl of	Somerley, Ringwood	2	0	0
Northey, G., J.P.	Cheney Court, Box, Wilts	1	0	0
*Northumberland, Duke of ..	Albury Park, Guildford	2	0	0
Nurse, F. G.	Wick Farm, Coxley, Wells	1	0	0
Nuthall, S.	Runtley Farm, Sutton Green, nr. Guildford	1	0	0
Nutt, Mrs. H. J.	Hampton House, Hampton-in- Arden, Warwick	1	0	0
†O'Hagan, Lord	Pyrgo Park, Havering Atte Bower, Romford, Essex .. ..	..	..	..
O'Halloran, Miss P.	Fairwood Lodge, Killay, Glam. ..	1	0	0
Orde Powlett, Hon. N. A. ..	Bolton Hall, Leyburn, Yorks. ..	1	0	0
*†Oppenheimer, Sir B., Bart.	.. ..	..	..	..
Osmond and Son	Grimsby	1	0	0

Subscriptions.

ccxi

Name	Residence	Subscriptions		
		£	s.	d.
Paddison, W. P.	Research Department, Royal Arsenal, Woolwich, London, S.E.18	1	0	0
Paget, L. C.	Middlethorpe Hall, Yorks ..	1	0	0
*Paget, Sir Richard, Bart. ..	74, Strand, London, S.W.1 ..	2	0	0
Palmer, W. H.	York Buildings, Bridgwater ..	1	0	0
Palmer, Mrs. W. Howard ..	Heathlands, Wokingham, Berks	1	0	0
Palmer, Brig.-Gen., C. B. ..	Berryfield, Bradford-on-Avon, Wilts	1	0	0
†Parker, Hon. Cecil T. ..	The Grove, Corsham, Wilts ..	..	..	..
*†Parker, F. J.	Plymouth Street, Swansea ..	..	..	..
Parker, L. M.	14, Sketty Road, Swansea ..	1	0	0
*Parry, J. E.	Talybryn, Bwlch, S.O., Breconshire	2	2	0
Parry, J. M. and Co. ..	Leominster, Hereford	1	0	0
Parry-Okeden, Lieut.-Col U. E. P.	Turnworth, Blandford	1	0	0
Parsons, F. J.	Venn Barton Stud Farm, Beaworthy, N. Devon	1	0	0
†Parsons, J. D. Toogood ..	Grasmere, East Hoathley, Sussex ..	..	..	..
†Parsons, R. M. P.	Misterton, Crewkerne .. ..	..	..	..
Parsons, F. W.	Speckington, Ilchester	1	0	0
Partridge, A. A.	Mordref, Plympton, Devon ..	1	0	0
Pass, Captain A. D... ..	Manor House, Wootton Fitzpaine, Charmouth, Dorset	1	0	0
Patey, Rev. C. R.	Stowford House, Ivybridge ..	1	1	0
Pawlyn, J. H. W.	Messrs. Ransomes, Sims & Jefferies (Ltd.), Orwell Works, Ipswich	1	0	0
Peacock, Miss C. T.	Hellings, Wiveliscombe, Somerset	1	0	0
Peacock, W.	3, Buckingham Gate, London ..	1	1	0
Pearce, C. E.	Sea Mills Farm, near Bristol ..	1	0	0
Pearce, E.	Parsonage Farm, Long Ashton, Bristol	1	0	0
Pearce, J.	Parsonage Farm, Long Ashton, Bristol	1	0	0
Pearce, T. H... ..	Parsonage Farm, Long Ashton, Bristol	1	0	0
Peel, Major E. Morton ..	St. Leonards, Langland, near Swansea	1	0	0
Peel, Viscount	52, Grosvenor Street, London, W.	1	1	0
Pentherthy, Professor J. ..	Dean Hall, Newnham Glos. ..	1	0	0
*Pender, Major H. Denison, D.S.O.	Strangways, Marnhull, Dorset ..	2	0	0
Pendarves, W. Cole	Pendarves, Camborne, Cornwall..	1	1	0
Penson, F.	Taston, Charlbury, Oxon.. ..	1	0	0
Pepper, W. F.	New Redlynch Farm, Bruton ..	1	0	0
Perfect Patents Company ..	195, High Street, Brentford, Middlesex	1	0	0
Perkins, Col. E. K., M.P. ..	31, Winn Road, Southampton ..	1	1	0

Name	Residence	Subscriptions		
		£	s.	d.
Perkins, F. H. S.	Wye Croft, Monmouth	1	0	0
Petherick, R., jun.	Acland Barton, Landkey, Barn- staple	0	10	40
Petters (Ltd.).. ..	Yeovil	1	0	0
Pettifer, T. & Co.	Eydon, Banbury	1	0	0
Peyton, E. P.	Woodcote Lodge, Kenilworth ..	1	0	0
Phillips, F.	Nantcoch, Newport, Mon. ..	1	1	0
Phillips, Sir L. R. .. ..	.. ..	1	1	0
Phipps, C. B. H.	Chalcot, Westbury, Wilts ..	1	0	0
Phipps, Hornby, Capt. ..	Hornblossom House, Alford, Som.	1	0	0
Pierce, E. T.	West Wood Farm, Filton, Glos. ..	1	0	0
Piggott, Brothers & Co. ..	220, 222, 224, Bishopsgate Street, Without, London, E.C. ..	1	0	0
Pike, C. A.	Chilean Nitrate Committee, Friar's House, 39-41, New Broad Street, London, E.C.2	1	0	0
Pinkstone, C. G. (Pinkstone (Ld.).. ..	24, Church St., Temple, Bristol ..	1	1	0
†Pinney, R. W. P.	Somerton, Somerset .. ..	..	..	..
Pitt, W.	The Albynes, Bridgnorth.. ..	1	0	0
*Plymouth, Earl of	Hewell Grange, Bromsgrove ..	4	0	0
*Poltimore, Lord	Court Hall, North Molton, Devon	2	2	0
Poole, Mrs. A. R.	King's Hill, Dursley	1	1	0
Poore, Capt. J.	Estate Office, Badminton, Glos..	1	1	0
Pope, Alfred	Dorchester	1	0	0
Pope, A.	Henstill, Sanford, Crediton ..	1	0	0
Pope, John	Nowers, Wellington, Somerset ..	1	0	0
Popert, Capt. A. H.	Forestry School, Parkend, Glos..	1	0	0
Popham, H. L.	Hunstrete House, Pensford, Bristol	1	0	0
Popham, Mrs. H. L.	Hunstrete House, Pensford, Bristol	1	0	0
Porter, F. H.,... ..	Greeway Park, Chippenham ..	1	0	0
Porter, W. J. H.	Glendale Farm, Wedmore ..	1	0	0
†Portman, Viscount	Buxted Park, Uckfield, Sussex ..	..	..	..
Portman, Vicountess.. ..	Buxted Park, Uckfield, Sussex ..	1	0	0
Portsmouth, Earl of.. ..	Barton House, Morehard Bishop, Devon	1	0	0
Powell, G. F.	10, Beaufort West, Bath	1	0	0
Powlett, A. T.	Goodmas'er Farm, Bruton, Som.	1	0	0
Preston-Jones, A.	Mickleover House, near Derby ..	1	0	0
Preston-Jones, J.	Rushbury, Winchcombe	1	1	0
Price, J. H.	Higher Hill Farm, Butleigh, Glastonbury	1	0	0
Price, Owen	Nantyrharn, Cray, Brecon ..	1	0	0
Price, W. S.	Nantymadog, Cray, Brecon ..	1	0	0
Prichard, H. L.	Penmaen, R.S.O., Glam... ..	1	0	0
Pritchard, E.	Wood Hill Park, Wootton Bassett, Wilts	1	0	0
Pritchard, W. A.	Brentmoor, Brent, South Devon	1	0	0

Subscriptions.

ccxiii

Name	Residence	Subscriptions		
		£	s.	d.
Proctor, H. & T. (Ltd.)	Cathay, Bristol	1	1	0
Proudfoot, W.	Woodbourne House, Shepton Mallet	1	0	0
Pullen, J. W... ..	Compton Greenfield, Bristol ..	1	0	0
†Purgold, A. D. .. ..	.. ..	..	..	..
Pursey, C. E... ..	Bailey's Court, Stoke Gifford, near Bristol	1	0	0
Pyke, C. C.	Capel Leyse, Holmwood, Surrey ..	1	1	0
Pyke Nott, E. G. I.	Haines Hill, Taunton	1	0	0
*Pyman, Sydney	Pigeon House, Ross-on-Wye ..	2	2	0
Quantock Vale Cider Co.	North Petherton, Bridgwater ..	1	1	0
Quested, J. E.	Cheriton, Kent	1	0	0
Quicke, Capt. L. A... ..	Newton House, Newton St. Cyres ..	1	0	0
Radcliffe, Wynham Ivor	Druidstone, near Cardiff	1	0	0
*†Radnor, Earl of	Longford Castle, Salisbury .. ..	..	..	..
Rawlence, Ernest A.	St. Andrew's, Salisbury	1	0	0
Rawlence, G. Norman	Salisbury	1	0	0
†Rawlence, Major M., D.S.O., R.E.	c/o Lloyd's Bank, Cox's Branch, 16, Charing Cross London, S.W.1. ..	..	..	..
Rea, F. H.	Kite's Nest Farm, near Wotton-under-Edge, Glos.	1	0	0
Rees-Stokes, C. W.	Warwick House, Tenby	1	0	0
Reeves, Robert and John, and Son	Bratton Iron Works, Westbury, Wilts	1	0	0
Rennie, J. H... ..	Porthycarne, Usk, Mon.	1	0	0
Reynolds, Sylvanus .. ..	.. ..	1	0	0
Richardson, Capt. A.	Seven Springs, Cheltenham	1	0	0
Richardson, Rev. A... ..	Bath and County Club, Bath	1	0	0
Riley, J. L. & A.	The Iwerne, near Ledbury	1	0	0
Roach, W.	Trewidden, Buryas Bridge, Cornwall ..	1	0	0
Roberts, C. M.	9a, York Street, Bath	1	0	0
Roberts, D. M., I.M.E. (J. Oculitas, Ltd.)	"Beaconfield," Grantham	1	0	0
Robins, O. T. and A. F.	Lidcott Hall, High Bray, South Molton	1	0	0
Robinson, E. S. & A. (Ltd.)	Redcliffe Street, Bristol	1	1	0
Robinson, John & Co.	Bristol	1	1	0
Rogerson, R. W. (Ward & Co., Seedsmen)	Northgate Street, Bath	1	0	0
Rollaston, S. V.	15, Brock Street, Bath	1	0	0
Rootsby, A.	Litchard Hall, Bridgend	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Roper, Geoffrey D.	Forde Abbey, Chard	1	0	0
Roundway, Lord	Roundway Park, Devizes	1	1	0
Rouse-Boughton, Sir W. St. A., Bart.	Downton Hall, Ludlow	1	0	0
Rouse-Boughton, Lady	Downton Hall, Ludlow	1	0	0
Rowcliffe, E. L.	Stovolds Hill, Cranleigh, Surrey ..	1	1	0
Rowcliffe, H. S.	Knole Lodge, Langton Green, Tunbridge Wells	1	0	0
Rowland, P. S.	Fairy Hill, Reynoldston, Gower, Glam.	1	0	0
Royal Guernsey Agricultural and Horticultural Society	Guernsey	1	0	0
Rubeck, O. P.	"Valencia," Meath Green, Horley, Surrey	1	1	0
*Rubin, Bernard	Halstead, Kent .. ..	..	..	..
Rudd, Mrs.	Felbridge Park Farm, East Grinstead, Sussex	1	0	0
Russell, G.	North Hill Farm, Dundry, near Bristol	1	0	0
Russell-Smith, A.	North Houghton Manor, Stockbridge, Hants	1	0	0
Ruston & Hornsby (Ltd.) ..	Grantham	1	0	0
Ryan, E. M., International Harvester Co.	80, Finsbury Pavement, London, E.C.2.	1	0	0
†St. Audries, Lord	St. Audries, Bridgwater .. ..	..	..	..
St. John Col. the Hon. Roland	Langford Budville, Wellington, Somerset	1	0	0
St. John of Bletsoe, Lord ..	Melchbourne Park, Beds.	1	0	0
†Salmon, H. C.	North Field, Bridgwater .. ..	..	..	..
Sale A. W.,	The Gables, Rotherfield Tunbridge Wells	1	0	0
Salter, Benjamin	Newlands, Broadclyst, Exeter	1	0	0
Salter, T.	Beare Farm, Broadclyst, Exeter ..	1	0	0
Samuelson, Ernest	Bodicote Grange, Banbury	1	1	0
Sanders, Lt.-Col. Right Hon. Sir R. A. Bart. M.P.	Bayford Lodge, Wincanton	1	0	0
Saunders, H. B. T.	Woodside Farm, Sparkford	1	0	0
Saunders and Biss	172, Sidwell Street, Exeter	1	0	0
Sawtell, G. H.	Kingweston, Taunton	1	0	0
Sayers, Messrs.	Groundwell Manor, Blunsdon, Swindon	1	0	0
†Scott, C. T. .. ..	.. ..	..	..	..
†Seaton, Lord	Buckland Abbey, Yelverton, Devon ..	..	..	..

Subscriptions.

CCXV

Name	Residence	Sub- scriptions		
		£	s.	d.
Senior and Godwin	Auctioneers, Sturminster Newton, Dorset	1	1	0
Shaw, Col. F. S. Kennedy, C.B.E.	Teffont Magna, Salisbury	1	1	0
†Shaw-Stewart, Walter R. ..	Hayes, Shaftesbury .. .. .	..	..	..
Sheldon, R. F.	West Street House, Wells	1	0	0
Shellabear, G. G.	Mounty Tavy, Tavistock	1	1	0
*Shelley, Sir John, Bart. ..	Shobrooke Park, Crediton	2	2	0
*Shelley, J. F.	Posbury House, near Crediton ..	2	2	0
Shelley, Mrs. J. F.	Posbury House, Crediton	1	0	0
Sheppard, G.	Eastfields House, Chepetow Road, Newport, Mon.	1	0	0
Sheppard, P. C. O.	Dunraven Estate Office, Bridgend, Glam.	1	1	0
†Sherston, C. J. T.	The Quarry, Amberley, Surrey ..	..	..	..
†Sherston, T. P. D.	33, Fowler's Road, Salisbury .. ..	..	..	..
*Sidmouth, Viscount	Upottery Manor, Honiton	2	0	0
Silcock, R. & Sons	Stanley Hall, Union Street, Liverpool	1	0	0
*Simpson, Charles (Hew- thorn & Co.)	7, Lambs Passage, Chiswell Street, London, E.C.1	2	0	0
Simpson, J. Hope	Blagroves, Oake, Taunton	1	0	0
*Singer, W. M. G.	42, Charles Street, Berkeley Square, London, W.1	2	0	0
Skidmore, Miss E.	Ashleigh Leigh, Box, Wilts	1	0	0
Skinner, Board & Co.	Exmoor Street, Bristol	1	0	0
Skinner, W. J.	The Laurels, Weare, Somerset ..	1	0	0
Smart, G. E.	Combe Hay Manor, Bath	1	1	0
Smith, A. Carlyle	Sutton Hull, Woodbridge, Suffolk	1	0	0
Smith, D.	Court Farm, Stoke Gifford, near Bristol	1	0	0
Smith, A. J. (Ltd.)	9, Queen's Square, Bristol	1	0	0
Smith, H. C.	9, Union Terrace, Plymouth	1	0	0
Smith, J.	Monkton, Hereford	1	0	0
†Smith, S. Lee	Larkfield, Maidstone .. .. .	..	..	..
Smyth, Hon. G. N.	Ashton Court, Bristol	1	0	0
Smyth, Hon. Mrs.	Ashton Court, Bristol	1	0	0
Smyth-Richards, G. C.	Filleigh Lodge, South Molton ..	1	0	0
Somerset, Duke of	Maiden Bradley, Bath	1	0	0
Somerset Farm Institute ..	Cannington, near Bridgwater ..	1	0	0
Somerset Trading Co. (Ltd.)	Bridgwater	1	1	0
†Somerville, A. F.	Dinder House, Wells, Somerset ..	..	..	..
Southwell, G. R.	Holbury Farm, Lockerley, nr. Romsey	1	0	0
Southwood, J. W. C.	1, St. Peter's Terrace, Twerton, Bath	1	0	..
Spear Brothers and Clark (Ltd.)	Southgate Street, Bath	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
†Spearman, Sir J. L. E., Bart. .. ..	.. ..	1	1	0
Speed, Capt. D. C. L. ..	Knowlton Court, near Canterbury	1	0	0
Speke, Capt. C.	Horton Cross, Ilminster, Somerset	1	0	0
Spencer, H. G.	Southill House, West Cranmore, Somerset	1	0	0
Spencer, W. C.	Bushley Park Farm, Tewkesbury	1	0	0
Spicer, Capt.	Spye Park, Chippenham	1	0	0
Spicer, Lady M.	Spye Park, Chippenham	1	0	0
Spiller, T. R.	Luccombe, Milton Abbas, Bland- ford	1	0	0
Spillers and Bakers (Ltd.) ..	Redcliffe Back, Bristol	1	1	0
Spurrier, H.	Stype Grange, Hungerford, Berks	1	0	0
*†Stanley, E. A. V. .. ..	.. ..	2	0	0
*Starr, W. W.	2, Central Bldgs., Trethomas, Mon.	2	0	0
Stephens, T. A.	Hookstile House, South Godstone, Surrey	1	0	0
Stephenson and Alexander ..	Auctioneers, Cardiff	1	1	0
†Stern, Sir Edward D. L. ..	Fan Court, Chertsey	1	0	0
Stevens, R. N.	Woodham Hall, Woking, Surrey	1	0	0
Stevenson, J. K. H.	The Chase, Upper Welland, Mal- vern Wells	1	0	0
Stewart, Rev. H. J.	The Vicarage, Cockett, Glamorgan	1	0	0
Stewart Richardson, R. M. ..	Idover House, Dauntsey, Chip- penham, Wilts	1	0	0
Stilgoe, H. W.	The Grounds, Adderbury, near Banbury, Oxon.	1	0	0
Stirling, Mrs.	Trym Bank, Combe Dingle, near Bristol	1	0	0
Stirling, B. W.	Trym Bank, Combe Dingle, near Bristol	1	0	0
Stoddart, F.	The Denny, Portishead, Somerset	1	1	0
Stoffell, W. M.	Fairfield, Newbridge Hill, Bath ..	1	1	0
Stonehouse Works Co.	Spon Lane Mills, Houghton Street, West Bromwich	1	0	0
Storey, H. L.	The Manor House, Malmesbury ..	1	0	0
Storr, Mrs. R.	40, Mecklenburgh Sq., London ..	1	0	0
Storrar, J. I.	Tredegar Estate Office, Newport, Mon.	1	0	0
Stothert, Sir P. K., K.B.E. ..	1, Lansdown Place, West, Bath ..	1	0	0
Stott, F. J.	Wellesley Arms, Wells	1	0	0
†Strachie, Lord	Sutton Court, Pensford, Somerset	..	..	..
†Strachey, Lt.-Col. the Hon. E.	Sutton Court, Pensford, Somerset	..	..	..
Strafford, Earl of	Dancers Hill, Barnet	1	0	0
Strangways, Miss S.	Shapwick, Bridgwater	1	0	0
Stratton, Richard	The Duffryn, Newport, Mon. ..	1	0	0
Strauss, E. A.	Kingston Bagpuize, Abingdon, Berks.	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
Strawson, G. F., J.P.	St. Andrew's Works, Horley, Surrey	1	0	0
Stride, T.	Stanley House, Camden Road, Bath	1	0	0
Strode, G. S. S.	Newnham Park, Plympton	1	0	0
Stucley, H. V. G.	Pillhead, Bideford, North Devon	1	0	0
Studley, J. Im.	Dale View, Toller Porcorum, Maiden Newton, Dorchester,	1	0	0
*Sutton, E. P. F.	Sidmouth Grange, near Reading	2	2	0
*Sutton and Sons	Seedsmen, Reading	2	2	0
Swansea, Lord, D.S.O., M.V.O.	Caer Beris, Builth, Breconshire	1	0	0
Swanwick, Bruce	The Road House, Rodborough Common, Stroud	1	0	0
Sword, Mrs. M.	Westcombe, Evercreech	1	0	0
Sykes, F.	Richings Park, Colnbrook, Bucks	1	0	0
Symons, J. & Co. (Ltd.)	The Plains, Totnes	1	1	0
Tagart, Major-Gen. Sir H., K.C.M.G., C.B., D.S.O.	Feniton Court, Honiton, Devon	1	1	0
Tangyes (Ltd.)	Cornwall Works, Birmingham	1	0	0
Tanner, R.	New House, Kingston Bagpuize, near Abingdon, Berks	1	1	0
Tapp, David James	Knaplock, Winsford, Dulverton	1	0	0
Tasker W. & Sons (Ltd.)	Waterloo Ironworks, Andover	1	0	0
Tate, Mrs. E.	Swinford Lodge, Rugby	1	0	0
Tate, J. A.	Fairfield, Wells, Somerset	1	0	0
Tavener, G. E.	Budlake, Devon	1	0	0
Taylor, A. H. W.	8, New Bond Street, Bath	1	1	0
Taylor, E.	Red House, Bath	1	1	0
Taylor, E. J.	Penarth Lodge, Julian Road, Sneyd Park, Bristol	1	0	0
†Taylor, George	Cranford, Hounslow, W.	..	..	..
Taylor, L. Acland	City Librarian, Central Library, Bristol	1	0	0
Taylor, R. B.	Hendford Lodge, Yeovil	1	0	0
†Tazewell, W. H.	Manor House, Taunton	..	..	..
*†Temple, Earl	Newton St. Loe, Bristol	..	..	..
Terrington, Lady,	Spinfield, Marlow, Bucks	1	0	0
Thackray, R.	Fords Farm, Calcot, nr. Reading	1	0	0
Thomas, A. O.	Kilvrough, Gower, Glamorgan	1	0	0
Thomas, Capt. L. B.	Great Brampton, Madley, Hereford	1	1	0
Thomas, I.	Ely Farm, Cardiff	1	0	0
*Thomas, J.	Velindre, Kidwelly, Carmarthen- shire	2	0	0
Thomas-Stanford, C.	Preston Manor, Brighton	1	0	0
Thomas & Evans & John Dyer (Ltd.)	Swansea	1	0	0
Thompson, C. D.	Wenvoe, near Cardiff	1	0	0

Name	Residence	Subscriptions		
		£	s.	d.
*Thompson, Major J. C. ..	The Vicarage, Stratton St. Margaret, Swindon	2	2	0
Thompson, V. T.	Norton Manor, Sutton Scotney, Hants	1	0	0
Thorne, J. G... ..	Horridge, Romansleigh, S. Molton	0	10	0
Thornton, W. A. .. ..	.. ..	1	0	0
Thresher, E. B.	Corfe Hill, Weymouth	1	0	0
Thring, Sir Arthur T. ..	Charlton House, Charlton Mackrell	1	0	0
Thurlow, G. R.	Stowmarket	1	0	0
Thynne, Lt.-Col. U. O. ..	Muntham Court, Worthing	1	0	0
Tilley, T. H.	Manor Farm, Biddisham, Axbridge	1	1	0
Tinsley, C. H.	Twyford, Pembridge, R.S.O., Herefordshire	1	0	0
Tipper, B. C. and Son ..	Balsall Heath, Birmingham	1	0	0
Titt, J. W.	Implement Works, Warminster.. ..	1	0	0
Toogood, E. K.	Messrs. Toogood & Sons, Southampton	1	0	0
Tope, H., Jun.	Belsford, Harberton, Totnes, Devon	1	0	0
Tory, R. N.	Anderson, Blandford, Dorset	1	0	0
Trafford, G. R.	Hill Court, Ross, Herefordshire	1	1	0
Trechmann, Major O. L. ..	Westaway, Barnstaple	1	0	0
*Tredegar, Lord	Tredegar Park, Newport, Mon... ..	2	2	0
Treffry, I. de C.	Penarwyn, Par Station	1	1	0
Treffry, Mrs. I. de C. ..	Penarwyn, Par Station, Cornwall	1	0	0
Tregonning, Capt. G. N. ..	Bryn Hafod, Llanelly	1	0	0
†Tremaine, W. H.	Sherborne, Northleach, Glos. .. ..	..	..	..
Tremayne, Col. W. F. ..	Carclews, Perran ar Worthy, Truro	1	1	0
Treowen, Lord	Llanarth Court, Raglan, Mon.	1	0	0
Trevethan, W.	Brondstone Hill, Chipping Norton	1	0	0
Trevilian, Major M. ..	Curry Rivel, Taunton	1	0	0
*Trollope-Bellew, Capt. Froude				
D.S.O., M.C.	Crowcombe Court, Taunton	2	0	0
Trotter, Miss	Chatley, Norton St. Philip, Bath	1	1	0
Troup, Lieut.-Col. Alan G.,				
D.S.O.	Knighton, Broadchalke, Salisbury	1	0	0
Trump, W.	Borough Farm, Broadclyst, Exeter	1	0	0
Tucker, M. & Sons	Broad Quay, Bath	1	0	0
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(17)

Total 1213

INDEX.

ACIDITY OF CIDER, CHANGES IN, 203
 Acidity of Poor Pastures, 78
 Agricultural Education and Research,
 Taunton, 106
 Analyses of Bottled Ciders, 210
 —, Instructions for obtaining,
 cxvii
 Annual Exhibitions, List of, cxvii
 — Financial Statement, clxxiii
 — Report of Consulting Chemist,
 241
 — Report of Society's Operations
 F. H. Storr on, 117
 Apple Aphis Permanent, 183
 Apples, Manuring deficiency experi-
 ments, 144
 Apple, Seedling, Early Fruiting of, 177
 — —, Root pruning, 180
 — —, Ringing of, 180
 — —, Pruning, 180
 Apple Stocks, East Malling Standards,
 36
 Arsenate Sprays for Willow Beetles,
 239
 Artificial feeding, District variation in,
 30
 Autumnal Sterility of Cows, 24

BACTERIAL FUNGOID PESTS, 64

Barker, B. T. P., on the National
 Fruit and Cider Institute,
 123
 — on Cider bottling, 199
 — on Sulphur Dioxide as preserva-
 tive, 226
 Basket Willows, H. P. Hutchinson
 on, 49
 — —, Suitable land for, 50
 — —, Sets, 53
 — —, Marketing of, 55
 Bastin, S. L., on Fungus Pests, 57
 Bear, E. M., on Commercial Fruit
 Culture, 34
 Black Currant Bushes, Manuring of,
 147
 Black Stem Rot of Potatoes, 64
 Bracken eradication, 12
 Brechley, Winifred E., on Spraying
 Weeds, 1
 Brienton Manor Fruit Farm, 41

Briton-Jones, H. R., on Plum Aphis,
 191
 Brown Rot of Plums, 191
 Butter Test, Taunton, 100

CALCIUM CASEINATE FOR SPRAYING, 45, 184

— cyanamide as a spray, 12
 — deficiency and Willows, 156
 — — and Fruit trees, 160
 Cash Account Summary, clxxiv
 — —, 1924, clxxvi
 Cattle Prize Awards, Taunton, xx
 Chickweed, Destruction of, 11
 Cider, Changes in Bottled, 202
 —, Deterioration of, in cask, 200
 —, Effect of Storage Conditions,
 205
 — Making Trials, O. Grove on, 221
 —, The Bottling of, 199
 Clean Milk Demonstrations, 103
 Clover Stem Rot, 63
 Clubroot, 70
 Committees, Standing, cxix
 Copper Sulphate as a Spray, 7, et seq.
 — —, Effect on Crops, 8
 Corn Rust, 61
 Council, Members of, cxviii
 Cresylic Acid as Egg-killer, 187

DAIRY DEPARTMENT. TAUNTON, 94

EELWORM IN STRAWBERRIES, 197
 Egg-killing Washes, A. H. Lees on,
 182
 Experimental Plots, The Society's, 80
 — —, Soil data, 82

FARWELL, MAJOR E. W., ON CIDER, AT TAUNTON, 110

Forestry at Taunton, G. Lipscomb
 on, 104
 Fruit Culture, E. M. Bear on, 34
 Fruit Plantations, Modern, 35
 — —, Overcrowding of, 35
 — —, Horse Cultivation of, 38
 — —, Motor Cultivation of, 39

Fruit Trees, Manuring of, 142
 — — —, Deficiency Experiments, 144
 Fungus Pests, S. L. Bastin on, 57
 — — — on Wild plants, 66
 — — —, Preventive Measures, 67

GOAT PRIZE AWARDS, TAUNTON, lxvi
 Gooseberries, Manuring experiments, 145
 Grove, O., on Cider Bottling, 199
 — —, on Sulphur Dioxide as Preservative, 226
 — —, on Cider Making Trials, 221

HALF-STANDARD FRUIT, ADVANTAGE OF, 35
 Hammond, J., on Milk records, 20
 Hoary Cress, Destruction of, 8
 Horse Prize Awards, iv
 Hutchinson, H. P., on Basket Willow, 49
 — —, on Willow Cutting roots, 155

IRON SULPHATE AS A SPRAY, 8

KAINIT AS A SPRAY, 11

LACTATION, BREED VARIATION IN, 22
 — —, Monthly Variation in, 23, 32
 — —, Effect of Service on, 26
 Leaf Area of Apples, 167
 Leaf Scorch of Apples, 151
 Leaves, Characters which govern spraying, 5
 Lees, A. H., on Egg-killing Washes, 182
 — —, on Plum Aphis, 191
 — —, on Red Plant of Strawberries, 196
 — —, on Willow Beetles, 238
 Lime, Effect of on sour pastures, 78
 Lime Sulphur as Egg Killer, 185

MAGNESIUM DEFICIENCY AND LEAF SCORCH, 152
 Maidstone Prize List, cxxx
 Mann, C. E. T., on Physiology of Nutrition of Fruit Trees, 160
 Manuring of Orchards, 47
 Members, List of, clxxxviii
 Members privileges, cxv

Membership privileges, The Society's, cx
 Milk Records, Variations in, 20
 Milk Test, Taunton, 98
 Milk Yield, Average County yield, 21

NATIONAL FRUIT AND CIDER INSTITUTE REPORT, 123
 — — —, Advisory work, 128
 Nettles, Destruction of, 11
 Nicotine Sprays for Willow Beetles, 238
 Nitrate of Soda as a spray, 10, et seq.

OFFICERS OF THE SOCIETY, cxvi
 Orchards, Cultivation of, 38
 — — — by pigs, 40
 — —, Pruning of, 43
 — —, Spraying, 44
 — —, Manuring of, 47

PHOSPHATES ON SOUR PASTURES, 78
 Phosphoric Acid and Leaf Scorch, 154
 Physiology of Nutrition of Fruit Trees, 160
 Pigs, among fruit trees, 40
 Pig Prize Awards, Taunton, lxxviii
 Plum Aphis, A. H. Lees and H. R. Briton-Jones on, 191
 Plums, Brown Rot of, 191
 Poor Pastures, Improvement of, 77
 Poppies, Destruction of, 8
 Potassium Deficiency and Willows, 158
 — — — and Fruit trees, 160
 Potato Scab, 64
 Poultry among Fruit trees, 42
 Price, A. T., on Cider at Taunton, 113
 Pritchard, E., on Small Holdings Comp., 114
 Pruning orchards, 43

RED PLANT OF STRAWBERRIES, 196
 Root Pruning of Seedling Apples, 180

SALT AS SPRAY, 12 et seq.
 Sanders, H. G., on Milk Records, 20
 Sheep Prize Awards, Taunton, lviii
 Silicate, Effect on Leaf Scorch of Soluble, 151
 Slime Fungi, 65
 Small Holdings Competition, Somerset, 114

- Soils, Effect of Weed-killing Chemicals on, 3
 Somerville, A. F., on Taunton Dairy Department, 94
 Spinks, G. T., on Early Fruiting of Seedling Apples, 177
 Spores, Production of Fungus, 58
 Spraying, Economic Value of, 12
 —, Cost of, 15
 —, Increased Crops due to, 17
 Spraying, Dry and Wet, 5 and 6
 — Weeds, Winifred Brenchley on, 1
 Spurry, Destruction of, 8
 Staniland, L. N., on Red Plant of Strawberries, 196
 Storr, F. H., Annual Report, 117
 —, on Taunton Exhibition, 90
 Sugar Beet, Hoeing of, 2
 Sulphate of Ammonia as Spray, 9, et seq.
 Sulphur deficiency experiments, 150
 — dioxide, as Fruit preservative, 226
 — —, Action on fruit, 232
 Sulphuric Acid as Spray, 12, et seq.
- TAR DISTILLATE SPRAYS, 46, 182
 Taunton Exhibition, F. H. Storr on, 90
 Taunton Show, Dairy, 94
 — —, Forestry, 104
 — —, Cider, 110
 — —, Judges, i
- Taunton, Horse Awards, iv
 —, Cattle Awards, xx
 —, Sheep Awards, lviii
 —, Pig Awards, lxviii
 —, Poultry Awards, xciii
 —, Small Holdings Awards, xci
 Thistles, Destruction of, 11
 Turnbull, G., on Vocational Training in Agriculture, 73
- UDAL, J. B., PLOUGHS FOR FRUIT, 38
 Udders, Growth of gland tissue, 26
- VOELCKER, J. A., REPORT OF CONSULTING CHEMIST, 241
 Vocational Training in Agriculture, G. Turnbull on, 73
- WALLACE, T., ON POOR PASTURES, 77
 — — Manuring of Fruit Trees, 142
 — — Willow Cutting Roots, 155
 Water Content in relation to Nutrition in Fruit trees, 169
 Weeds, Control of, 1
 Weed-killers, Laws governing application of, 3
 Wheat Bunt, 69
 Willow Beetles, A. H. Lees on, 238
 — Cutting Root Development, 155

END OF VOL. XIX.

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CATTLE—continued.

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CATTLE—continued.

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SHEEP—continued.

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PIGS.

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